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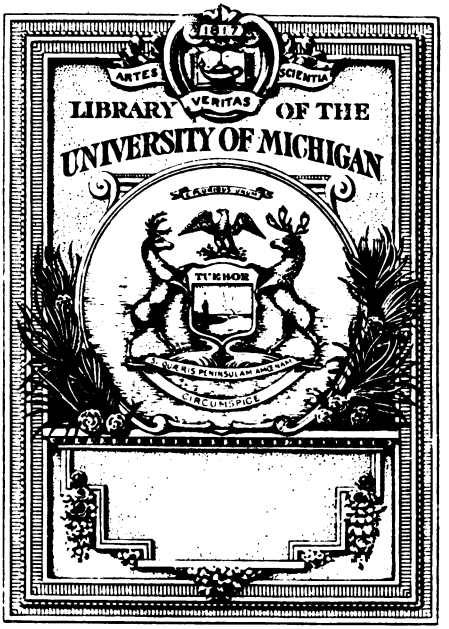
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DISCOURSE ON TRUTH.

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BY

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A DISCOURSE ON TRUTH

CHAPTER I.

PRELIMINARY.

ALL those serene philosophers, who from age to age have ascended above the mists of earth into the pure æther of speculation, have ever been at pains to inform us that the aim of their pursuit was the Truth. This it is that they profess to discover to mankind, whether they offer it to them in its simple form, or in that more refined quintessence, which they are wont to call Truth absolute or Truth for all intelligence. As the results which they respectively bring down to us seem, at least to the eye of the uninitiated, to differ greatly both in colour and form, a simple man might reasonably ask whether the thing which all seek is precisely the same, and might desire some explanation of the object of their search. 'Tell me,' he might say, 'what is that which you expect to find, and how you will know it when you have hit upon it.' He might ask with Pilate, 'What is truth?'

To this question, which we might naturally think would be settled at the very starting-point of the journey, very few of those great metaphysicians, who profess to have arrived at the goal, deign to give any answer. Doubtless they would say that any man who was so unlearned as to miss the meaning of so plain and usual a word, was all-unworthy of their august attention; while he, who, understanding it, was so uncandid as to raise difficulties and questionings at the very outset of their undertaking, deserved nought but scorn for his frivolous sophistry.

If a man were to press them further and say unto them, 'O great teachers, I confess me simple and unlearned, but I earnestly seek after knowledge, nor do I think I am altogether without understanding, yet can I not resolve this question; I pray you, therefore, set forth in some short form of words, what you mean by Truth,' they would probably urge, that, as all words must be explained by other words, there must be at least a certain number whose meaning is assumed to be understood by all men; for, unless that be so, we should ever explain the unknown by the equally unknown, and thus ceaselessly wander in the darkness; that Truth, then, is one of those ultimate words which are themselves better understood by mankind than any other words that could be used to explain them, and that he who will not or cannot understand, must be content for

ever to sit down in ignorance. That the first part of this argument is irrefragable, no sober man will deny; but, in its application to the word before us, I humbly hope to show that these great men are mistaken.

What, then, are those words which are most suitably left unexplained? Assuredly those as to whose meaning men can arrive at agreement by some other method than that of words. What this method is, and what are the words to which it is applicable, will be sufficiently obvious from a few instances. If any man knows not what I mean by the words *dog* or *tree*, my surest means of informing him is to point to the one or the other object, and no verbal explanation will give him a clearer idea of my meaning, though doubtless a scientific definition may convey a more carefully limited notion. If, on the other hand he asks me 'What is Justice?' it is obvious that I cannot follow the same easy method which I before employed; I must now betake me to words, and say, 'Justice is the giving back to every man the exact equivalent of his own deeds,' hoping that every word in this sentence will be better understood than the one word to be explained; a hope in which I am often deceived.

We have thus far got to this point, that all the names of natural objects may be safely left unexplained, and may serve as the starting-points for definitions, but it requires little thought to see that these by themselves

will not be sufficient to form the foundation of all our intercourse with each other. We have fortunately several other classes of words whose meaning we may make clear by the same or a similar process. We may make clear the meanings of such words as Like and Unlike, Near and Distant, by means of pairs of objects varying in those points presented to direct observation. Again, we may show the meaning of any word denoting action by performing that action; and here I think we come to the end of our directly explainable words. But it is clear that all these will not take us far enough, for we have as yet got no words explanatory of our inward feelings—our joys and griefs, our hopes and fears. Unless we can be certain that we mean the same thing when we use terms expressing these, full half our speech in bulk, and that by far the most valuable half, remains yet without firm ground whereon to rest its feet. Here, then, we might seem to be brought to a standstill, for it is manifest that we cannot directly employ our former method; we cannot put a finger on one emotion and say, 'This is Love,' and forthwith touch another and say, 'Behold, here is Hatred.'

Happily even here Nature leaveth us not in doubt. She hath so ordered that the simpler emotions, such as Pain and Pleasure, should—unless when suppressed of intent—reflect their presence on the countenance and gestures, and betoken their presence by such signs as

are roughly the same in all men, and, to some extent, in all animals. The external signs, it is true, give no direct knowledge of the thing signified, since they in no way resemble it—a smile is not like joy, nor can be compared with it—but they refer us back to ourselves and bid us reflect what were our feelings when we exhibited similar signs; we can then have but little doubt that our neighbour's feeling now resembles ours of yesterday. In the same way, if I wish to explain to any one without the use of words what pleasure or pain is, I may either point to a man at present under the influence of one or the other of these emotions, or I may counterfeit them as well as I can in my own face. By either method I may feel pretty sure of making my meaning understood.

How many of the internal changes of the soul can thus be explained by external gesture is a question to which it is not easy to return a certain answer. It must be referred for solution to the men of science, who shall tell us to what extent the variations of the face are indissolubly connected with changes of the soul. This at least we may safely say, that beyond the first and most simple feelings, the changes of the face are so delicate and hard to seize that they offer no sufficiently secure means of interpreting shades or varieties of feeling. For the more complex emotions we have to employ a mixed process. We combine our names of the simple feelings, which we can have no doubt our hearers

understand, with other names of qualities or relations which properly belong to external experience, and which are explainable by immediate reference to the senses, as 'Great,' 'Small,' 'Bitter,' 'Sweet,' etc. By these combinations we are able to convey some kind of notion of all our more delicate internal operations and affections, though whether that notion be accurate we may greatly doubt. In many cases we are constantly kept aware of the fact, that the expression used is a mere metaphor, as, for instance, when we talk of *black Care;* but the expression *heavy affliction* is no whit less metaphorical, since the word *heavy* has only a real definite meaning when referred to tangible objects. In sooth, the necessity under which we lie of explaining by far the larger part of the internal world by means of expressions which properly apply only to the external, involves all our talk on moral and emotional themes in a mistiness from which the clearest thinkers cannot entirely free themselves.

We find, then, that all those words which can be fully explained without use of other words, and which are thus fitted to form the elements or material of language, fall under three heads; we have first, names of external objects with their qualities and obvious relations, such as greatness, littleness, etc.; second, those of actions; and third, those of some few simple emotions. All other words must, I affirm, be explained

by means of these; and every clear definition or explanation must be at length reducible to these elements. We have now to ask, Does Truth belong to any of the three classes which we have discovered? If it do not, it seems clear that a definition is required, and that after all it was the duty of the philosophers to have given us one. Yet to whom is it not manifest that that which we all mean by Truth is something utterly different from any of those things of which we have treated? It can be neither simple emotion nor action, and to attempt to identify it with any external, sensible object, or even with any quality or relation of such sensible objects, would be an absurdity into which no sane man would fall. Our philosophers, then, were dealing disingenuously with us; unless it be that, having ascended so high to the mountain top, they had forgotten the difficulties of the first slope, and the arts by which they themselves overcame them and mounted up aloft.

I will bring the matter between us to a very simple issue by a homely illustration. Suppose our philosopher wrecked on some unknown land, inhabited by a race as far advanced in civilization, and in all intellectual and moral development, as ourselves, but every word of whose language was unknown to him. Let us see how he would set about learning their language, and what words he would understand first. Surely he

would touch sensible objects as a sign that he wished to know their names, and would learn them. He would rub his stomach to signify the pain of hunger, and open and shut his mouth to show his desire to eat, and would be taught the names of the feeling and of the action. Thus he would rapidly enlarge his knowledge of all the names of the three classes which we have mentioned, and would soon be fully equipped with all the language of common life. But how and when would he discourse to them of Truth, his proper subject? Not, I imagine, until he was familiar with their methods of combining that fund of elemental words with which we have supposed him already stocked. Through some such combination, and thus only, could he convey an idea of the subject of his discourse. This combination of words would then be the natural explanation or definition of Truth in that language. That such a natural definition must exist in all languages, and that without it the notion of Truth will for ever remain vague, appears to me so apparent from our foregoing discourse, that I shall put myself at no further pains to prove it.

Let us seek then for some combination of our elemental names, which will give us, if it may be, a clear notion of that which is said to be the final aim of all science, and all philosophy. But first let us look again whether among the vast company of the philosophers, there be not one who has given us that for which we seek. Plato

talks of Truth as the Science of the Ever-existent, but I fear me the terms of the definition are not in any way reducible to our three classes, while it is obvious that it excludes almost the whole of what humbler mortals consider true. For instance, that Victoria is Queen of England, is clearly not a statement falling within this definition. In sober sadness the master was thinking, not of that humdrum work-a-day Truth with which we are at present concerned, but of that airy spirit of Truth which is pursued and captured only by philosophers.

I am inclined to think that Aristotle meant simply to give a definition of Truth in a sentence to which most of his interpreters assign a much more lofty aim; where he says, 'He that thinketh of the separate as separate, and of the conjoint as conjoint, is in truth, but he is in falsehood whose thoughts are not in accordance with facts.' This definition, if it be a definition, is obviously intended to explain that same earthly truth with which we are concerned, but it seems open to objection, both for its vagueness and for its narrowness. We cannot precisely determine what our author intended by the expressions 'the separate,' and 'the conjoint,' and, although we might be able to enlarge and explain the sentence in such a way as should render it an adequate definition of Truth as we conceive it, yet we could only achieve this at the cost of the commission of the most

serious, although the most common, offence of historians of philosophy, to wit, the reading into the text of an author, ideas and forms of thought which are in reality the product of the mind of the critic. This at least we may say, that the only Truth here spoken of is that of thought, which, as I shall hope to show, is not the only, nor even the most proper sense of the word which we seek to define.

After Aristotle, we may pass over a host of writers, ancient and modern, from whom some sort of definition of Truth may be indirectly abstracted; and a few who make grotesque attempts at a direct explanation of the term. Of these latter, perhaps the most simple, but by no means the most absurd, is the booby who was the author of that list of definitions which some cruel editor attributed to Plato, but which certainly has borrowed more from Aristotle in its form, and nothing from either in its spirit. 'Truth,' quoth he, 'is a habit in affirmation and denial; or a knowledge of true things.' O marvellous discovery!

There remains yet one definition of truth for us to consider—a definition so infinitely superior in value to any of its predecessors, that it seems almost presumption to criticize it, one, indeed, from which I differ rather in matter of form and extraneous adjuncts, than as to the substance or spirit which underlies it. I mean that of Locke, one of the greatest because the humblest

of philosophers, who carried the method of Bacon into the intellectual world with a consistency which Bacon himself at times fell short of. He, following the order of nature, and not attempting to prune her to fit systems or theories, discovered that the notion of Truth was a complex one, and could only be properly explained after the examination of all those simpler elements of thought whose names are capable of a non-verbal explanation, and which he classifies—although from a somewhat different point of view—in a fashion which accords sufficiently well with that which we have given.

In the fifth chapter of the fourth and most glorious book of his 'Essay on the Human Understanding,' he gives us the following passage. "'What is truth?' was an enquiry many ages since; and it being that which all mankind either do or pretend to search after, it cannot but be worth our while carefully to examine wherein it consists; and so acquaint ourselves with the nature of it, as to observe how the mind distinguishes it from falsehood.

"Truth then seems to me, in the proper import of the word, to signify nothing but the joining or separating of signs as the things signified by them do agree or disagree one with another. The joining or separating of signs here meant, is what by another name we call 'proposition.' So that truth properly belongs only to

propositions; whereof there are two sorts, viz., mental and verbal; as there are two sorts of signs commonly made use of, viz., ideas and words."

This explanation of Truth takes its form from the main doctrine of Locke, that all our knowledge consisted of a stock of ideas which (at least with regard to external things) were produced in us by sensation, and remained in the mind after the sensation was at an end. These ideas were, as he says, the signs of external things, but they need not at all necessarily resemble the thing signified, any more than the names which are the signs of the ideas resemble the ideas themselves. There is considerable doubt as to whether he considered the ideas as modifications of the sentient mind, or as separate things existing in it as counters in a bag. It must be admitted that his language gives great colour to the latter absurd hypothesis, although great stress must not be laid upon detached expressions in a writer who intentionally adopted a loose and conversational style. We must at least admit that the whole theory is open to grave objections, and the definition of Truth, as he gives it, must, of course, stand or fall with the main theory, although I hope to be able to show that the correct definition differs from this in little more than form of statement. I may remark, in passing, that the expressions 'agree' and 'disagree' do not seem applicable, without great straining, to all true propositions.

It must be true to say that 'Some Romans were cowards,' but the notion of Roman, and that of coward, obviously do not agree; while of 'some Romans,' independently of any individual Romans, I have clearly no idea other than that of Romans in general.*

Since, then, all our questioning of the sages has led us to no satisfactory result, let us endeavour humbly, by the light of plain common sense, to arrive at a solution of this all-important question, following that method by which alone the meaning of any word can be ascertained; that is, by the comparison of all the various uses of it in a number of sentences taken at random; if, haply, we may discover a common factor in all of them.

* Sir William Hamilton says that almost all philosophers concur in defining Truth as the agreement between thought and its object, and quotes a passage from Aquinas where this view is expressed. But All the Schoolmen, and All Philosophers are phrases which do not mean precisely the same thing, though Sir William Hamilton is at times inclined to identify them. The assertion is certainly inexact as far as the majority of English philosophers is concerned, and I believe it is also untrue of the majority of French thinkers of the last century, though it is hard to speak with certainty as to a point which in most cases is not definitely raised in their writings (Cf. Hamilton, "Lectures on Logic," Lecture XXVII., vol. ii. p. 61–63, ed. Mansel and Veitch). Père Malebranche, in his treatise, "De la Recherche de la Vérité," declares that Truth consists in the knowledge of pure ideas which the spirit gains when it retires to commune with itself, putting aside altogether the delusion of the senses. But this phase of the Cartesian doctrine is really rather theological than philosophical (Cf. Preface, p. 6, ed. 1712, *et passim*). Mr. G. H. Lewes, in the Prolegomena to his "History of Philosophy," has a definition of Truth, which though doubtless sufficient for his purpose, seems too vague and general to be of much service towards elucidating a discussion of which the necessary starting-point is a clearly defined understanding of the meaning (or meanings) of the word Truth (Cf. G. H. Lewes, "Biographical History of Philosophy," Prolegomena, p. 31, 3rd ed.).

If we fail to meet with this unifying element, we must conclude, either that our wits are too feeble for the work which we have in hand, or that two or more really distinct meanings lie lurking under the cover of this one word. The method is as old as Socrates, and has always been known as the Socratic induction, though its differences from induction in the modern sense are so great as to render the use of a common name for both extremely misleading.

I find that we talk of a truthful man, meaning by the epithet one whose words are in accordance with his thoughts, or more strictly speaking, one whose words are such that according to the ordinary use of language they will raise in the person to whom he is speaking thoughts like to those which he has in his own mind on the subject in hand. When, however, we say that a statement is true, or a truth, we mean to express not only its accordance with the present thoughts of the speaker, but its further correspondence with some past experience of himself or of some one else. If the memory of a writer be defective, although he may honestly and with pains explain to us the present state of his belief as to some past event, at which he has been present, we do not allow to his account the title of truth, though none would deny to the writer himself the epithet truthful. I believe that truth, in the most ordinary and proper acceptation of the term, lies in this

double correspondence first between the words and the thoughts of the speaker, and secondly between those thoughts, and some past experience of himself or of some one else. We frequently, by a kind of ellipsis of thought leave out the middle term altogether, and talk of a truth as that which is in accordance with facts. But facts must mean either our experience or that of some one else. If then, the experience be ours, we convert that experience into a truth by stating it, if it be that of some other, then we can only know it through his statement; and that statement is a truth according to our definition.

To reduce our definition to terms of the three classes of words, which themselves need no further explanation, a further step is needful. We have said that a truth is a statement which will raise in the mind of the hearer, thoughts or ideas like to those of the speaker; when those latter ideas exactly represent the past experience of himself or some one else. By experience we mean either sensations, activities, or emotions; by ideas, mental images of these; mind, I fear, is a factor which we must leave unexplained, unless we say that its notion may be formed, like that of the simple emotions, indirectly, by means of its external signs; that, if I wish to give another a correct idea of what I mean by mind, I must point to a number of actions which betray intellect and forethought, and tell

him that I mean by mind that principle, or power, of which he must be conscious within himself, by which he would perform like activities. No words can make the matter clearer to him.

We have now got an explanation of Truth in terms of what we have called the simple elements of speech, and we have seen that our definition will agree with the vast majority of instances of man's use of the word. But we must not lie down in slothful content with our discovery, lest some enemy come and overthrow our fortress with the engine of some fully acknowledged use of the word which falls not within our definition. We must show how all other uses which are in any way proper depend upon, or are derived from, this central meaning, or, if proof of this be not forthcoming, how it is that mankind at large combine several discordant notions under one name. We need not, however, harass ourselves about any particular use of the word by any one man or set of men, however distinguished he or they may be. Common consent and usage is the only mint whose stamp we need, or can, acknowledge. The import of this proviso shall be seen hereafter.

I freely admit that there are several familiar uses of the word Truth, and many more of its corresponding adjectives (true and truthful), which can in no way be squared to my definition. Let us examine a few of the most important. We talk of a *Truthful*

Likeness, and a *True Christian*, and in neither case is there any notion of speech or of its correspondence with thought or fact. It may be said that these expressions are metaphorical, and the first one, I think, is confessedly so, while the second has, from frequent use, lost all savour of metaphor, and seems to stand out as an independent meaning of the word 'true,' since it certainly is not included in our former definition. That, however, it is not an original use of the word may, I think, be clearly seen from the fact that the substantive Truth cannot be used in this connection. *Christian Truth* is not the correlative of a *true Christian*, but means something entirely different. What that something is we shall enquire later, meanwhile let us fix our thoughts on the two instances which we have taken, and which seem to me to have a similarity to each other. Do we mean by a truthful likeness more than this—that it is one which strictly resembles the face on which it is modelled; or again, by a true Christian aught else than one whose whole life is modelled on the pattern held up in the Bible for his imitation? 'True,' in both these expressions seems to mean merely 'like,' with this addition—that the likeness to the pattern is in both cases produced by deliberate will of an intelligent agent. Now let us turn back to our ordinary definition of truth; here, too, we have a double likeness or correspondence; first, between thought and experience;

secondly, between words and thoughts. Moreover, this second correspondence must necessarily be produced by deliberate and intelligent volition. Now assuming that the original sense of the term Truth was this correspondence intelligently produced in one object-matter, to wit, words, it might naturally be loosely extended to a similar deliberate correspondence produced in another object-matter, actions, marble, or what not. Such an extension of usage is too common to call for any further enquiry.

We now go forward with greater boldness to a more difficult case. What is the meaning of a true prediction? I mean not here to treat of infallible prophecies, but of such forecasts of wise men as have been afterwards justified by facts. It is obvious that our original definition will not serve our turn. There is here no correspondence between the words of the new and the past experience of himself or of any other man, or at least it is not by virtue of any such correspondence that we call his prediction *true*.

That there is a correspondence must be admitted, but it is in inverse order, it lies not from facts to words, but from words to facts. If we shall say that truth lies in the correspondence between the two, and that the order matters nought, then the truth in this case is a quality not of the words but of the facts. It is the facts that give to the words their truth, and this truth only arises

at the moment of their fulfilment, and so far we do not seem to be at variance from common opinion. We talk of events falsifying prophecies, and might with equal reason talk of their verifying them. But if the truth only arises at the time of accomplishment, how is it that at that very time we talk of this truth in the past tense? We say, 'Now do I perceive that the prediction was true?' Ought we not rather to say, 'Now is the prediction true.' And how shall we account for so strange and universal an error? I believe the solution of this difficulty is not far to seek.

All those who have studied the Nature of Man, have been forced to the humbling avowal that the human mind notwithstanding its boasted superiority, is as much the creature of habit, and finds as great a difficulty in originating new activities as any of the separate limbs. When it has once been accustomed to follow one line of thought with regard to any given object-matter, and to clothe it with one form of words, it is apt lazily to transfer this form wholesale to every similar object-matter, which is newly presented to it, without closely considering whether the formula be applicable to the new matter, nor even whether its application may not give rise to inconsistencies and absurdities. Surely the consideration of this weakness and loth of the mind may help us to resolve our present difficulty. Do we not see that in the vast majority of

cases, where there is a correspondence between words and facts, the facts come first and the words following later agree thereto. The mind then is, by long use, inclined to consider the correspondence as perfected at the moment when the words are uttered, and to this correspondence *at this moment* it assigns the name Truth. But when it extends the use of this latter word to those comparatively rare cases of correspondence, wherein the facts are the first term, and the words but the second, by reason of this sloth whereof we have spoken, it still uses a form of words, and perhaps even of thought, which implies that the correspondence is complete, and that therefore the truth is born, at the exact moment when it is in the more ordinary order, to wit, when the words are uttered. At this moment, in the case of predictions, there is in fact no correspondence, since the first term—the words—only is given, and the second term—the facts—may never come forth from the womb of time. But when, if ever, the facts make the long-ago spoken words true, the common sort of mankind perceiving that there is a truth (in this wider sense of correspondence between words and facts), carelessly assumes that this truth or correspondence must have arisen at the time when it is accustomed to look for it—at the utterance of the words—(which in such cases must always be in past time); and therefore at the moment of the fulfilment or the making-true of the prediction declares that

the prophecy *was* true, instead of using the more proper form, 'it *is* true.'

When we say that the promises of the Bible are true, I fancy that our words combine two distinct meanings. To the believer these promises are the very words of God Himself, with whom time is not, and who hath knowledge of what shall be even as of what is, since to Him all things now are. When, therefore, God speaketh to man His will, there is necessarily that double correspondence which is most properly called Truth. 'God is not a man that He should lie,' therefore do His words reveal His mind. He knoweth all things, therefore do His thoughts contain, or duly represent, all that hath been or shall be. This sense, then, is clear enough. It is true that one, at least, and perhaps all three of the kinds of experience which we have mentioned are inapplicable to God; but, however incomprehensible the methods and nature of His knowledge may be to us, His Truth is His language in accordance with that knowledge. But I think we mean to express, also, our confident hope that these promises will be true to us in the same way as ordinary predictions are true; that is, that some day we shall perceive the facts agreeing with the words we now know. In this sense we should, of course, more properly say that the promises *will* be true, since their truth is not yet perfected. But even as before we changed the present into a past, so here,

and for precisely the same reason, do we change the future into a present.

There remains one most important order of truths yet to discuss. We habitually talk of laws of nature as true in the highest sense; and we should not be considered guilty of an impropriety of language, were we to say, that a collection of all such laws would include the whole realm of Human Truth. What mean we by Truth in this context? It seems to me that these laws are true in three of the senses which we have noticed above. First, many of them (as the axioms of mathematics and the more obvious physical laws) are true in the sense of being exact statements of the experience of innumerable men.* The number and comparative unimportance of the persons who made the statement renders the ellipsis of the speaker, which we have already noticed, so easy as to be absolutely imperceptible. Secondly, many of the wider laws, as, for instance, that of gravity, cannot be said to be correct statements of experience in any of the senses into which we have analysed that term (see p. 15), since we obviously have no direct consciousness of such laws. These are rather, I think, to be classed as prophecies which have been fulfilled, and therefore become true in an innumerable number of cases. Thus, the position of any given star,

* But see *infra*, Chapter VIII., where the nature of that experience is explained.

or the general appearance of the heavens at any given day or hour, has been innumerable times predicted by the use (among other data) of the law of gravity, and on each occasion, when the day or hour came round, the eyes of many men have directly confirmed the truth of the prophecy.* Lastly, both these two classes of laws of nature are regarded as prophecies which we hope will be fulfilled in an innumerable number of future cases. What is our warrant for this expectation we shall consider later, but for the present may be content with noticing that this expectation will justify us in applying to the laws of nature the name Truth in the second of the two senses which we found applicable to the promises of the Bible.

I have searched my own thoughts, and the common speech of mankind, and can find no other meaning of our term which is universal. If any man knoweth of one and will instruct me, I profess myself his willing disciple, but in the meantime go forward with no slight confidence that I have explored every corner of this not very extended field. I sum up, then, to this effect. All the more proper uses of the word Truth imply some kind of correspondence between words, thoughts, and

* This view of the nature of true laws, which was propounded by Whewell, is contested by Mill (Cf. "Mill's Logic," Book III., Chapter II.). I fail to see the force of his arguments, which however will stand or fall with his doctrine of Causation, to be hereafter discussed.

facts, but the name is loosely applied to the two truncated halves of any one such complex correspondence; that is, either to a simple correspondence between two thoughts and facts, or to a similar agreement between words and thoughts. It is, moreover, with still greater latitude, applied to a few other correspondences, which do not consist of these three parts; as, for instance, that between the marble and the human form. In all cases, however, there is a correspondence or similarity between two or more things, and it is this which constitutes the most important element in the notion of Truth.

We must now return to the philosophers, with humble apologies for having neglected them so long, and enquire of them, What is that supreme Truth whereof they are for ever talking, whose worth outvalues all lesser and partial truths, and from which alone they derive their validity? Which be the terms in whose correspondence it consists? To this I find it hard to get any direct and positive answer; but I easily meet with a multitude of indirect and negative ones. I am told that it is Truth for all intelligence. But Truth for all intelligence cannot be accordance between the experience of any individual intelligent being and his words or thoughts; for we know that the sensations of different human beings vary greatly, and the variation would be indefinitely extended if we imagined other orders of intelligent beings, as the majority of the philosophers

bid us do. In fact, on this point there is a marvellous agreement between them. They all aver that the Truth they seek is nothing phænomenal, that is, nought which may be directly gained from sense. Still less can it be accordance between the words or thoughts of any being and his emotions or activities, for these are confessedly more various in different individuals than are even the sensations. Their Truth, then, is not the Truth whereof we have all along been talking.

But they will doubtless tell us that our definition of experience is too narrow, and that there are other elements thereof which we have omitted. Let them name them, then, and say with what element of experience their thought or their words are in accord, when they gain or state their Truth for all intelligence. Or will they altogether reject our definition of Truth? I know full well that in matters of this nature every man runs great danger of error, but I would humbly remind them that it was their neglect of what seemed a most important part of their duty which launched me forth on my dangerous voyage.

Even now, at the eleventh hour, I will humbly accept correction, but I make this alone stipulation. Let their definition, when they produce it, not only cover their peculiar use, but be at least equally applicable with mine to all the common usages of the word. Nay, say they, the thing we seek differs in kind from aught that

common men conceive or talk of. So be it, and I leave you in possession thereof; yet why apply to your rare discovery a name which is used by plain men in an entirely different signification? By all means, if you will, use every word in a sense that is not apprehended by the vulgar, and were you not the great philosophers that you are, I should say that you reminded me of nothing so much as of children who delight to interchange in the nursery a gibberish which is not understood of their elders. Meanwhile, I fear me, I must plod soberly along with my task without your aid.

Of all the varieties of Truth which we have gone through, there are two only with which I shall deal in this book—Truth in the most ordinary sense of the word by which a man communicates his experience and that of others, and true laws of nature. I shall inquire how far a man can by words arouse in another a state of thought resembling his present thought and his past experience, and what are the surest methods for so doing. Secondly, I shall consider our means for discovering true laws of nature, the character of the evidence which induces us to believe in them, the value of these laws themselves, and our warranty that they will remain true for all time.

And here I beg leave to give a warning which I ought, perhaps, more properly to have placed at the beginning of my book. I write not solely nor specially

for the learned, of whom the greater part will doubtless condemn my work. I appeal to any man of ordinary candour and understanding who will be at the pains of considering these matters with me. As I cannot, therefore, assume a knowledge of preceding systems or writings, I shall often enter into explanations and digressions which may seem to those who have drunk deeply of philosophy, or even, as is the more frequent case, skimmed lightly over its surface, both tedious and impertinent. Of this my intention I have already given them a foretaste in what I have written above. If they mislike it let them shut the book, for I shall persevere in it to the end. I would rather waken up to sincere and unprejudiced considerations of these questions one plain man of unbiassed understanding than secure the tepid approval of all the judges of philosophic style in the universe. The real lover of Truth, be he learned or unlearned, will have patience with me to the end, if only he shall judge that I too am an earnest worshipper of his goddess. The approval of one who is both learned and earnest I prize above all things; that of him who is earnest without being learned, I highly esteem; but for him who has been corrupted by a various diet of philosophies not having a digestion strong enough to assimiate any, I care not for his strictures, neither value his praise.

I fear me greatly that, notwithstanding this my pro-

fession, I shall not be able in all cases to avoid the use of technical phrases or elaborate arguments. The nature of the subject must needs lead me at times into intricacies which will tax the attention; and to attempt to explain every term whose use was necessitated by a controversy or quotation, would be as futile as it would be tiresome. I will promise, however, to restrict as much as possible the number of such technical terms, and, if it may be, to keep my main argument entirely free from them.

CHAPTER II.

ON DEFINITION.

THE object of all speech being the raising in the mind of another like ideas to those which are present at the moment in the soul of the speaker, it is above all things necessary that the speaker himself should have assurance that each one of his individual words will convey to the listener the same impression that it produces on him. The only way by which he can make certain that this is the case, is by defining carefully each word about which he thinks there can possibly be any doubt. That is, by stating as fully as possible what ideas the utterance of the word wakes in his mind. If his hearer had before no notion at all of the meaning of the word, he will now be able intelligently to follow a discourse which otherwise would be meaningless to him; if, on the other hand, the word does raise ideas in his mind, and those ideas differ in any way from those which the speaker attaches to the word, the definition will disclose the discrepancy and prevent numberless errors and misunderstandings. To use a familiar illus-

tration: if I wish to explain to a countryman the merits of the Franco-German war, I shall labour in vain until I discover that he considers Frenchman as the equivalent of foreigner, but when having made that discovery I get him to understand and accept my more limited use of the word, the chief difficulty of my task will be removed. Clear definition then is a necessary first step in the communication of Truth. We must now ask what is the best form into which such definition should be thrown.

We saw in the last chapter that there were two grand classes of words—those whose meaning must necessarily be explained by words, and those which might be explained by some more direct process. It might seem then, that in treating of definition we were only concerned with the former class, and might consider all verbal explanation of the latter superfluous. It may appear strange, then, if in my discussion of definition I limit myself almost entirely to one subdivision of this second class of words, yet the reason for my so doing is not far to seek. In truth we have already said almost all there is to say as to the definition of those words which are names of things, whose notion is not capable of being directly conveyed to any other person. They can only be properly defined by combinations of words as to whose meaning we can come to some direct agreement either by pointing or by some other of the processes of

which we have before spoken. Even by this method of combination we can, in many cases, get only a vague and doubtful idea, nor can we ever be quite certain that the terms we use are understood in exactly the same sense by our companion. The reason of this is, that in such cases, as, for instance, when talking of a complex emotion, such as that produced by music, at least a great proportion of the terms we use must be borrowed from the external world, and such terms can never be strictly applicable to our internal consciousness.

Since then, in ultimate resort, all our correctness of language depends upon our proper use of the second class of terms, and since it is with regard to these only that we can arrive at a perfectly definite agreement, it is all important that we should not fail in a matter which Nature has placed so entirely in our own hands. Yet success is neither so easy nor so obvious as it at first appears. With regard to two out of our three sub-classes of original terms, we have indeed the means always ready to hand of conveying a just idea. We can always counterfeit the outward signs of an emotion, or perform before our companion any simple activity; but the third class presents greater difficulties. If I had always around me at the moment of discussion the whole visible and tangible universe, I apprehend that no definition of external things would ever be given or required; the simple method of referring our companion

to his own eyes and other senses, would always be resorted to; for it is to this process that the ultimate appeal must always be made. But since the number of things which can at any moment be thus directly referred to is necessarily extremely small, in almost every case I have to betake myself to language, and it therefore behoves me to consider in what words my definitions of sensible things should be couched.

The first obvious method of describing sufficiently an absent object, is to mention some present or well-known object to which it bears a considerable resemblance, and to declare wherein the thing to be described differs therefrom; this is the method almost universally employed by the vulgar, neither is it in any way scientifically indefensible. To describe a tiger as "a mighty big cat that lives in the woods out here in India, and eats oxen and horses," or Vesuvius as "for all the world just like the hill over our village, only a sight bigger, and with a great round hole at the top," would probably be to raise as accurate an idea of the thing described as would be in any way possible in the mind of the person spoken to.

But this method is in very many, perhaps in most cases inapplicable. To give an accurate idea of an elephant to a person who had never seen one by comparing it with any of our English animals would be obviously impossible. Moreover, in almost all cases

there is a vagueness in the account of the differences between the thing described and that to which we liken it, which vagueness must needs be reflected in the mind of the listener.

If, then, we can find a method of definition of external objects which is universally applicable, it will be well, for the sake of simplicity and consistency, to apply it even in cases where the method of comparison with familiar objects will afford as accurate, and perhaps a more vivid idea of the thing defined. Such a method is yet to seek; but after what we have already said, it may not be hard to find. Let us see first, however, whether all things which are presented to our senses are in any way definable. Supposing a man to be blind, it is agreed by all philosophers and physicians that it is absolutely impossible to give him any notion of distinctions between colours. Again, suppose him, as is often the case, to be blind with regard to only one particular colour, to be insensible, for instance, to the distinctions between green and blue, here, too, no words can in any way enlighten him. He may know that others are conscious of a distinction which he knows not, but of what that distinction may be he can form no conception whatsoever. We may say the same thing of distinctions between sounds in the case of a deaf man, and that etween tastes in one of a vitiated or insensible palate. enerally we may affirm that of any simple experience

due to any of the five senses no one can form an adequate conception, who has not himself received it.

But this incapacity for definition is not the only peculiarity of the simple sensational experiences. They have also this important quality, that they (or at least the most important of them) are continually reproduced in a number of objects which are otherwise utterly unlike, and thus enable us to convey an idea of at least certain qualities of those objects to one who has never seen them. Thus, he who has seen a certain shade of deep blue on a sky or a dress, may form a sufficiently exact notion of the colour of the Mediterranean sea if he be told that it exactly resembles this shade. Nor is this all. Our experiences of natural objects are, in fact, mere combinations of the simple sensations. It might seem obvious to any man not a philosopher, that he learns all he knows, or can know of any external object, by means of his five senses, and though certain philosophers have doubted this statement, it becomes us not to puzzle ourselves with these subtleties, but to go straight forward in the light of plain common sense. Seeing, then, that we have agreed that our ideas are the result of our experience, and that all our external experience is the result of a combination of these simple sensations, it follows of necessity that all our ideas of external objects should be combinations of the simple ideas representing these simple sensations—that

our idea of this or that special plant, for instance, should be merely a combination of simple ideas of its colour, smell, taste, &c. It is true that we have also notions of its size, weight, shape, &c., which we do not get directly from sensation, but by the comparison of several sensations (for I must be able to remember the weights of other minerals before I can say that lead is heavy or light). Since, however, these notions are built up out of several simple sensations, we may say, generally, that all our knowledge of the external world may be ultimately analyzed into a number of simple sensations variously combined.

Philosophers, from the time of Locke, have been wont to call the mental reproductions of these simple sensations our simple ideas, and to say that the best way to define any given external object was to state the simple ideas which are combined in its compound notion. Thus, for instance, a correct definition of a plough would be a statement of all the simple ideas which we associate with its name—its colour, shape, size, weight, &c. (several of these ideas are, as I said above, not strictly speaking simple ideas, but as they have been very long ago and very easily constructed out of such simple ideas, they are usually, for convenience, treated as such). We shall add thereto a statement of its uses, which themselves are known by simple ideas, and can be resolved into them, and our definition will be complete.

So far we have travelled along the beaten track of English philosophy, and arrived at a result which by far the majority of modern logical writers could accept, but when we come to probe the matter deeper, and to ask what are the simple ideas which we habitually associate with the name, and whether all or only some of them should be used in definition, I fear we shall discover a gulf between our doctrine and that of the Schools which can in no wise be bridged over.

I may take one step further on firm ground, and say that philosophers are agreed in calling the qualities of a thing those of its powers by which its nature is made known to us. For instance, heat is a quality of fire, and produces in us a direct sensation. It is the quality of a magnet to attract iron, and that quality makes itself manifest to our sight, and if need be, to our touch. Whether all the qualities of the object make themselves known to us by means of sensation, or whether some be not communicated in some other fashion, is a question much debated among philosophers. I follow the majority of English philosophers in holding that sensation is our only source of knowledge of external nature; but the difference of opinion on this point has little or no bearing on the subject in hand, since those who imagine that certain qualities of external things are known to us otherwise than by sensation have included amongst them few, if any, qualities which are not common to all

objects, such as extension, that is the filling of a definite portion of space. Such qualities can obviously form no part of a definition which is intended to enable us to distinguish an object from all others.

What then are the qualities which should enter into the definition of an object? All that the name connotes, say the sages. That is, all the sensations which that name recalls to me. But it is obvious that to each one of us it may recall a somewhat different set of sensations, according to the varieties of experience. To a man who has just torn his hand in a rose-bush, the notion of the possession of thorns will form a very prominent portion of the general idea of the rose-tree, while in the ordinary mind that idea, though no doubt somewhere present, is latent, and is not immediately called forth by the name. Again, to the man of science the name of any metal or chemical substance will suggest innumerable qualities which represent experiences of his own, but which are absolutely unknown to the majority of mankind. Shall we then say that the only perfect definition is that which represents both ordinary experience and scientific knowledge with regard to the thing defined? I pray you to consider whether such definitions will not continually increase in bulk as science advances, and will not ultimately become so unwieldy as to be absolutely useless. Or are we to take the scientific definition only? This obviously would, in many cases, not enable an ordinary

man to recognise the thing defined when he came across it. Or, lastly, shall we include only the most common qualities in our definition? To this course there are two serious objections; for in the first place it is almost impossible to ascertain with any certainty what are the most common qualities of the object as discovered by the experience of all mankind; and in the second place, it is by no means certain that these common qualities, if discovered, would enable us to distinguish the object from all others, since between objects whose occult qualities differ very widely, the more obvious differences are often but small and little noticed.

Is there then no way out of the labyrinth? I think there is; and that one which will enable us to give, in some respects, more satisfactory and complete definitions than even the cumbrous process which the logicians seem to recommend. Let us consider a little more closely what the object of a definition is. We have said that it is to produce in the hearer a state of mind with regard to the given object as nearly as may be similar to that of the speaker. Now the speaker presumably possesses a number of ideas about the object resulting from a more or less frequent experience of it, but there is more in his mind than a mere chaos of detached ideas. These ideas, as it seems to me, form a regular system, arranged in a definite order, and even were it possible for him to convey to his hearer all these ideas according

to the requirement of the logicians, his work would yet be most imperfect and defective, if he merely poured them out higgledy-piggledy, and forebore to make the hearer understand that in his own mind, and in the minds of other people, who had seen the object, there was a certain arrangement of ideas in thinking of it, so that both he and they always began with one idea or set of ideas, and went on to others, but not *vice versâ*. If, from the number of ideas which the name of the object suggested to him it were impossible to include all in his definition, it would obviously be wiser to content himself with naming those which naturally came first into his mind and the minds of others, since presumably these would be the more important. My object is to discover if there be any principle by which we can determine what are those first ideas of each object which may most suitably be used for a definition. The task, I think, will not be a hard one.

The order of ideas in the mind as to any object is in nowise arbitrary. Even as the ideas themselves, or at least all those of which we now treat, have their originals in sensation, so is the order in which they occur correspondent with the order in which the sensations which we have received from the object have occurred in the different times when we have met with it. Were the order of sensations absolutely variable, then would the ideas occur at one time in one order and at another

in another; but in almost every case the order of sensation is fixed with regard to any one object, and in by far the greater number of instances the sensations with which on each occasion we begin our experience of any object, belong to the same organ of sense. Of this at length.

Let us suppose ourselves fully endowed with all natural faculties. Let us for the first time view a plant or flower as we are passing it on the railway or in a carriage. On this occasion the only knowledge we get of it is through our eyes, and our only idea of it must necessarily be of the nature of a picture. But now suppose that we be botanists or herbalists; we set out then in search of the plant; we see it at a distance; and we then approach it and smell it; perhaps we also feel it and make remarks on its texture. Yet a third time, we send for it and have it placed in our study or laboratory; we enter the room and perceive it on the table. We make experiments which give us further knowledge, that is, more multitudinous ideas with regard to it. Now, after some days or months, let some other person or us ourselves mention that object's name. That name recalls to us at once all or some portion of the sensations we have experienced from that object, but it recalls not all at once, nor all with equal strength. First come back to us those sensations which on each of the three occasions on which we have seen the object were first

presented to us, to wit, those which we gained through our eyes. We should recall first ideas of its form and colour, in fact a picture of the object. On these would follow, and in many cases after a perceptible interval, ideas of the other sensations which on the various occasions had followed those of sight. Moreover, as the appearance of the object had been presented to us on all three occasions, whereas its other qualities had perhaps none of them been presented to us on all (as in the instance we have taken), and certainly had not been present with us so long, since we probably looked upon the object while we were noticing its smell and taste or sensation to the touch; it follows naturally that unless there be any disturbing cause, our notion of the appearance of the object would be much more strong and vivid than that of any of its other qualities.

It is true that the vividity with which we realise a sensation does not depend solely on the frequency of its occurrence, since the vividity of the sensation itself on a single occasion will produce an idea of a strength which may fully equal that created by several weaker sensations. Thus a man who has been burnt will for a long time connect with the name of fire the notion of acute pain, rather than that of pleasing warmth, although the latter sensation has been far the more frequent in his experience. But these disturbing causes are neither frequent when compared with the whole bulk of sensa-

tion, nor are they in any way calculable, so that we must put them aside when we attempt a scientific treatment of the subject. Disregarding them, we arrive at the conclusion that the notion which we get through our eyes of any given external object is, as a rule, both first in point of time, and infinitely more vivid, than that which is due to any other sense. Not only is this the case, but in most cases the sensations due to the other senses follow no definite order. Many things, as for instance a cherry or an apple, I may one day touch without tasting, and the next taste without touching, and there is no reason, except the greater vividity of one of the two experiences, why the idea of one sensation should follow rather than that of the other, after the visual image which we form when we hear the name of the fruit mentioned.

I have said that in *most* cases the first set of sensations which we get from any natural object on any occasion when we meet with it comes from our eyes. We must observe, however, that this rule, although very general, is not absolutely universal. There are substances, such as assafœtida or garlic, of which the smell is both presented to us earlier than the taste and endures longer, that is, is still felt by us after the object has disappeared from sight. In these cases our first and, in fact, almost only notion which is aroused by the name, is an idea or remembrance of a sensation of smell

and the thing would be most aptly defined in terms of smell, were it not that to distinguish in words between varieties of smell is much more difficult, and much more liable to error, than to state distinctions of shape, size, and colour which are presented to our eyes.

Let us place ourselves in fancy in the middle of a landscape, and consider how very few of the objects before us affect us in any way except through our eyes. Those clouds above us may, it is true, fall on us in rain, but we cannot associate in thought the sensation of being wet by a storm with any one cloud, since we have much more frequently than not watched the clouds without any such sensation. Of all the trees and acres of corn and grass which form the picture, shall we touch one leaf or one blade of grass in a million? Or have we any distinct notion as to the difference of feeling between the substance of an oak-leaf and that of an elm-leaf, although we can easily distinguish them by the eye? The air we perceive, is fragrant with innumerable scents of flowers, but the Spring's 'breath is blending all blasts of fragrance into one,' and how few of us could distinguish the different scents which are due to each blossom!

The reports of the eyes then furnish us not only with the first and most vivid impressions of almost all natural objects, but with regard to by far the larger number give us literally all the knowledge which we individually and directly have of them. (I put aside for the

moment the knowledge which we may get from books, or from those who have made it their business to enquire more deeply into the qualities of these substances.) It seems naturally to follow that of all these objects our primary and central notion will be a representation of the thing as it appears to our eyes, and that any other qualities of that thing of which we may happen to have experience or knowledge will follow in thought with greater or less rapidity, after this central picture has been roused by the mention of the name.

I appeal to any man to interrogate his own consciousness, and say whether his notion of any given thing is not chiefly—I had almost said entirely—a picture of that thing as it appears to his eyes. If this be the case, and definition be, as we have been told, an explication of our notion or concept of any thing, then the only way in which we can at once avoid tedious length, and give to our hearer as complete as possible a notion of the state of mind aroused in us by the mention of the name, will be to give as full as possible a description of those qualities which are presented to our sight, the colour, size, shape, etc.

We shall affirm then that a correct definition of anything is that which describes it as we see it, and that the *thing* of which we think and talk is primarily that which we see. We shall in future, therefore, in talking about things, or our ideas of things, mean always

to express things visible, and the number of simple ideas of sight which make up our whole mental picture of the thing. The other qualities of the thing which we experience later, its smell, etc., we shall call its attributes. No attribute in this sense of the word need ever enter into our definition of the thing; nor do they in ordinary conversation. For any special purpose in discussion or instruction, it may be important to add to the definition proper of the thing, some one or more of its most important attributes, as for instance, after describing to a child the appearance of deadly nightshade, I should tell him that its berries were poisonous. But what this additional attribute may be, and to what sense it may belong, depend entirely upon the subject of the discourse. With the description of the appearance of the thing the invariable and universal portion of the definition ends.

I have now answered to my own satisfaction the question which we set ourselves at the outset '*What is the correct definition of an individual external object?*' but the logicians will neither admit that this is the correct solution, nor that the question which we proposed was in any way soluble. They will say that we can only define classes of things, such as Dog or Horse, and that this or that special dog or horse, we may describe but cannot define. They affirm that the only words which are properly the subject of definitions, are those which

have a meaning; that dog or setter has a meaning, but that Carlo or Shot, as applied to a dog has none. I confess that I do not think this distinction deserves all the importance that is usually attributed to it. No name has any meaning of itself, that is, does not naturally give rise to any notions beyond that of its sound, but by being habitually applied to the same objects it in time arouses in us all the notions which we have gained from those objects. The name Carlo arouses in me only, or in me and my intimate friends, a number of ideas and memories of which the central and most important one is the picture of a beloved dog. The name setter arouses in me and a much larger number of men, but by no means all mankind, nor even all Englishmen, a less vivid group of ideas, of which the central one is a somewhat misty picture of a dog of a certain size, shape, and colour. Now if I wish to communicate to some person, who knows not Carlo nor the meaning of the word setter, a correct representation of the ideas aroused in my mind by each of the two words respectively, I shall obviously use the same process in both cases. The fact that the ideas aroused by the word setter, are common to a much larger number of people than those awakened by the hearing of the name Carlo, will no doubt render my information as to the effect of the former word on me much more valuable to my hearer than like information as to the latter word, but it can in no

way affect the method by which I impart that information.

But let us meet our assailants on their own ground, and inquire what is the best method of defining a class of natural things, such as horse, dog, or minnow. This question, according to our former agreement, is merely the equivalent of the following:—What is the best method of conveying to any person the idea or group of ideas suggested to us by the words 'horse,' &c.?

Now it seems obvious, and is agreed by most of the philosophers, that we can have no general idea of the class Horse, except by means of our memory of individual horses. Some have gone so far as to affirm that the general name always arouses in our mind some individual memory, that when I try to conceive the notion of a horse generally I always in fact picture to myself some individual horse which I know better than all others. I do not, however, think it necessary that we should go to this length, which would of course amount to a denial of the possibility of forming any general ideas whatsoever. We may and must allow that any definite picture which we form in our minds must be individual, and that such an individual picture will in almost all cases be the copy of some individual experience; though even here, something must be allowed for the power of fancy in uniting portions which in experience have always been detached. But

not even in the external world is everything presented to us in definitely marked outline. If I look out of my window to-day, and survey the view, the near trees and houses stand out sharply, while the distant hills fade away in hot mist. Of the former I have a clear image, of the latter hardly more than hazy suggestions. As it is with the outward world of sight, so surely may it be with the inward world of ideas. An individual idea seems to me to resemble some detached object, each part of which we can survey and examine minutely. A general idea is like a wide-stretching landscape, whereof portions stand out clear in the sunlight, while the remoter regions fade away in the distance. What, then, are the clearly marked, and what the misty and doubtful features of this complex whole? The fixed and vivid portion will consist of those qualities which have been common to all our experiences of the individual members of the class. The vague and shadowy background will consist of qualities which have varied in different members of the class with whom we have met. Other things being equal, each individual experience will count as a single unit towards the forming of the general idea. The chief exceptions to this rule are that instances nearer in time will have more effect than those more remote, and that those in which we have taken an interest, or in which our attention has been excited by the conjunction of our

experience with some violent emotion, whether pleasurable or painful, will counterbalance a very large number of mere ordinary neutral-tinted experiences. Thus, my own pet dog, whom I have seen hundreds of times, and whom I love, will have a far greater share in forming my general idea of the class Dog than any other single animal. Yet will not his image correspond with my notion of the class, for that notion will be modified by my experience of many other dogs, and the individual peculiarities of my own dog will become hazy in the general idea in exact proportion to the extent of my experience, while the common qualities of all dogs will stand out more clearly by contrast.

If I have not erred in my account of the nature and growth of general ideas, I may safely conclude, First, that if the sensations which I received from the individuals have followed a definite order on each occasion when I have met with a member of the class, the ideas in my general notion of the class will follow the same order. Second, that if a certain species of sensations have a superior clearness and steadiness in each individual experience, the ideas representing the same species will be most vividly represented in the general notion. Now we have before seen that the sensations given us by the eyes both come first in almost every individual experience, and are by far the most permanent. It follows then that the ideas of these are the first

in order, and by far the most important in the general notion, and will most suitably form the centre of our definition; and, in fact, if that definition is not to stretch itself out to an unwieldy size, and wander away into regions where the thoughts of the greater portion of the people who use the word will not follow it, it must stop at a general description of the appearance to the eyes of the class of objects defined. Thus our former labour has not been thrown away, even although we restrict the use of definition within the limits assigned to it by logicians.

It may be objected that although we admit that the visual appearances of the respective individuals in the class form the first and most important parts of each individual experience, yet these individual images vary so greatly, that it will be impossible that they should combine to form one picture. They would simply obliterate each other. The objection is an important one, and, as far as it goes, perfectly valid; but I would ask, Is there any one quality of which we have ordinary experience, and which is naturally suggested to the unscientific mind by the name, which is one whit more stable through all the members of the class, than the more important portions of the general appearance? That there are qualities which are invariably present in all members of the class, and which enable us to give a scientific definition of it, I willingly admit, but these

qualities are not such as are immediately and frequently presented to the notice of the ordinary observer, and do not therefore form a portion of the notion suggested by the class-name. According, therefore, to the admission of the logicians, these invariable qualities ought not to form a portion of the common definition of that class-name. There remain no others which are equally fitted for this definition with those which we used for what I have been bold enough to call the definition of an individual name—those which constitute the least variable portions of the appearance to the eyes of all the members of the class.

The objection which I have just mentioned, and the observation on which it is founded, suggest a very important question. Can we, and do we, form general ideas of widely extended classes? I think that to this question we can, in the light of what has gone before, return only one answer. The more widely we extend the limits of a class, the greater variation is there between the different members with regard to all qualities, whether visual or otherwise. Each variation renders our general notion more misty, till the whole picture becomes one blur. If I interrogate my own consciousness, I find I can form a fairly definite notion or mental mage of a Gordon Setter or Retriever, but that it is difficult, if not impossible, to form one of a dog. If we limit the use of the term natural kind or class to that

of which we can form some sort of mental idea or picture, or to express the same thing in other words, of which we can give a true natural definition, such classes will not rise far above the generality of those which the Logicians call Infimæ Species, or lowest and most narrow kinds. All classes wider than these I shall call artificial, as representing no single mental idea or picture. Of these wider classes and their definition I shall treat below.

In the meantime I would desire my reader to mark, that even if we limit definition to the description of the mental image which arises in the mind on the mention of the name of the class, and which represents as well as it may the actual appearance of the individuals, yet can the advance of science greatly alter, enlarge, and improve our definitions. In almost all species of animals, plants, etc., there are certain marks which, though not sufficiently striking to arrest our attention, are always presented to us whensoever we view those animals, and thus, as it were, lie latent in the idea of the class. Now, if it happen that any of these marks are important from a scientific point of view, as belonging to all individuals in the class, and as distinguishing them from individuals of another class, which otherwise greatly resemble them in appearance; by calling attention to any such important mark, Science can render it no longer a latent but henceforth an active portion of

our experience of each individual, and thus for the future a vivid portion of our general idea.

We have now arrived at a conception of definition for individual names, and for those of low or small natural classes, which is in exact accordance with our statement of the nature of Truth in general, but when we come to treat of names of wider classes, and their definitions, difficulties thicken upon us.

We desire first to discover what, in fact, one of these wider classes is; Secondly, and as a consequence of this discovery, whether we have any general notion of such a class; Thirdly, by what means, if at all, I can truly define such a class.

Let us take, for instance, the word animal. That I have no mental picture of an animal like that which I have of a Newfoundland, seems to me too obvious to require proof. That I have a notion of breathing is true, but it is always indissolubly combined with the idea of the creature who performs the action. I can imagine a breathing horse, dog, or man, but a creature breathing and not being some one kind of known animal, I can in no way picture to myself. Breathing, in fact, is a quality whose idea is indissolubly connected with a considerable number of varying mental pictures, but which vanishes from the mind the moment the mental picture to which it is at the time attached is removed. I can no more conceive it apart from some

individual breathing thing, than I can conceive colour altogether separated from form. Since, however, I have noticed that this quality belongs to a number of diverse things, instead of stating this fact in the form, Horses breathe, Dogs breathe, Pigs breathe, etc., I sum up my experience in the form 'Horses, Dogs, and Pigs are Animals, or Breathing Creatures,' the two expressions properly meaning precisely the same thing. The latter, sentence is a kind of mental and verbal shorthand for the former. But the shorthand process does not end here. In the same way as it was noticed that horses, dogs, etc., all breathed, so too it was remarked that, sooner or later, they all died, and a sentence was therefore constructed summing up this experience like the former one in the terms Dogs, Horses, etc., are mortal. Now, it was noticed that all the Natural Classes who had the quality of breathing, sooner or later presented to us the experience of their decay and death, and having already formed the artificial term Animal, which binds together all these classes, mankind were able to state still more shortly their experience of the death of horses, dogs, etc., by saying 'all animals are mortal.'

I call the term Animal artificial, since it represents no Natural Class, and calls up into the mind no single picture. In the same way the sentence 'All animals are mortal' is artificial, as requiring to be translated into

the number of sentences for which it stands before it conveys any definite notions. I can think that dogs are mortal, since I can form a picture of a dog, and superinduce on it the ideas of phenomena which I know to be signs of death. That animals are mortal I can in no wise think till I have first written out in full in my mind the word animal into horse, dog, pig, etc., or some of them.

I may notice that from this point of view a simple or natural sentence is that whose subject is the name of a thing of which we can form a mental image, as Pig or Dog (if, indeed, we must not go yet lower for our Natural Kinds of some of the best-known animals), and whose predicate is an adjective expressing some quality which belongs (or does not belong in negative propositions) to the subject. Here the proposition represents at once and simply a mental state or process—the envisaging of the thing as possessed or deprived of the attribute.

All other propositions as to external things are artificial, as representing no one mental state, but as standing symbolically for many, and requiring to be broken up into one or more of those simpler sentences for which they stand before they can in any way affect the mind of the hearer. If I be told that no carnivora have cloven hoofs, I run over in my mind the Dog, the Cat, the Lion, and other natural classes with which I am

acquainted, and consider the attribute to be denied of each of them successively. Then, and then only, has the sentence any meaning for me.

We see, then, that any of these larger classes is formed for the purpose of brevity of speech, by means of a word which suggests or connotes a quality of which we can form no separate idea, but which we have often noticed as the attribute of many known Natural Kinds. Any word connoting an attribute common to several classes may be thus used, for the purpose of making an artificial class, but the choice of such words is not altogether arbitrary. There are certain qualities which are common to a number of natural kinds which have nought else in common. These will obviously be useless for the formation of artificial classes, since no other quality will be truly predicable of the class as a whole. If Leopards, Tigers, Antelopes, etc., be all spotted animals, but have no one quality in common besides their spottedness, it will be absolutely useless to form the class Spotted, since we can make no true universal affirmative propositions with regard to it. We cannot say that all Spotted are anything else. There are other qualities which belong only to a number of kinds, all of which kinds have several other attributes in common; each one of these latter attributes extending beyond all the kinds to which the former quality belongs, but extending in a different direction from any of the rest. Sup-

pose, for instance, that it be true that all animals which chew the cud show the further phenomena of absence of canine teeth and the presence of a prehensile tail, whereas each of these latter attributes belongs also to several other kinds, but not to the same in the two cases; then will the attribute of rumination form a more convenient link for tying together the several natural kinds into one artificial class than either of the other two. We can say All Ruminants have prehensile tails, and again All Ruminants lack canine teeth, but we cannot, from the evidence before us, make any universal proposition which shall be true either of all animals with prehensile tails or of all animals which lack canine teeth. Those attributes which, by reason of their being as it were the sign of the presence of other attributes, have been used as connecting links to tie up artificial classes, give rise to two substantives and an adjective or participle. The adjective is the word used in describing some given thing or class as possessed of the quality, as we say a breathing man, the one substantive the name of the quality, as 'breath,' the other the name of the artificial class whereof each member possesses the quality, as 'animal.' Those qualities which are signs of no other qualities give rise only to the substantive which is their name, and the adjective which connotes the possession of them. In many cases, as in that of the term Ruminant, the adjective and the artificial class-

name are the same in form, but in use they are essentially different words.

I know not whether I may make my statement clearer to any by the use of symbols, yet as this matter seems to me of importance I must omit no means which may in any way serve to render my meaning apparent. Suppose, then, that all the natural kinds A B C have the attribute P, while all the kinds A B C E have the attribute Q, and all the kinds A B C F G have the attribute R. Then in virtue of the possession of the attribute P, we may call every member of the three kinds A B C, and we might similarly concoct two names, q and r, representing the possession of the attributes Q and R respectively. Now we can say truly that 'all p is q,' and 'all p is r,' but we cannot say either 'all q is p,' nor 'all q is r,' nor again, 'all r is p,' nor all 'r is q.' P, therefore, is a fit quality for making an artificial class, while Q and R, as far as we can see, are not so fitted. Therefore either p will have to be used both as substantive and adjective, *e. g.*, Ruminant, or a new substantive will have to be formed which shall be shorthand symbol for each of the different members of the class separately. The other two attributes, Q and R, will remain adjectives, neither will any substantive be formed connoting the possession of q or r.

We have seen that these artificial class-names are formed upon the possession of some attribute, and so

far as they have a meaning at all, imply the possession of that attribute. But since I cannot think of the possession of anything except in reference to its possessors, the use of such general terms necessarily refers me to the individual Natural Kinds which I know to possess the attribute, and it is upon this function of referring me to the Natural Kinds, and not upon their more apparent purpose of suggesting an attribute, that the whole importance of these artificial general terms depends. So much is this the case that after a time we entirely lose sight of the attribute on which the name was founded, and think only of the kinds which it binds together. Who thinks of the phenomena of breathing when he is talking about animals? From this observation we shall easily pass to another which will show yet more clearly how curiously conventional the greater portion of our language is; conventional not merely in the sense that the words are arbitrary signs for ideas (for that of course they must needs be), but in the further peculiarity that many of these profess to represent an idea which is absolutely inapplicable to a great portion of the things to which they are ordinarily and quite properly (considered as artificial class-names) applied.

Let us take our old illustration—the word Animal. That the phenomenon of breathing, that is, the rejection of carbonic acid gas and the taking in of oxygen, by means of the action of the lungs, was common to Man

with the ox, the horse, and most known living creatures must early have been observed. Mankind thus in their infancy formed the habit of using the word animal, which, if it means anything, is equal to breathing-thing, as an artificial link for binding together all the Natural Kinds which were possessed of the complex mass of varying qualities which we call Life. As time went on, many other species of creatures were discovered which had so many points of resemblance with acknowledged animals that they could be more conveniently classed with them than with aught else, yet had not the special quality of breathing by means of the lungs which the word Animal properly connoted. A choice now lay open to mankind. They might either form a new word to tie up together into a larger class these newly-observed specimens and the already known animals, or they might arbitrarily extend the use of the word Animal to cover these new specimens, although it was well known that the quality from which the word originated belonged not to them. Those languages which are derived from the Latin adopt the latter alternative, and we accordingly use habitually, as a name for an extended class, a word, which, in so far as it has any meaning in itself other than as an arbitrary mark for tying a number of kinds together, is absolutely deceptive.

Luckily, as we have seen, no one ever does think of breathing when he talks of animals, and therefore scien-

tific men are left free to settle any definition they may think most convenient for the whole artificial class, utterly untrammelled by any association which the word itself might naturally suggest. In many instances, and perhaps in the one before us, some such course as this is absolutely necessary.

Suppose, for instance, that two, three, or more very important attributes are common to a certain number of natural kinds. Further, that each of these attributes taken separately belongs to a considerably larger number of kinds, and that the extension of each one of them into adjacent kinds is in a different direction from that of each of the others. Now, obviously, it would be very convenient if we could make an artificial class comprising all the kinds to which all these attributes belong, since there would be several important universal propositions which we could truly state about each of them. But it may be, and often is, the case that there is no one attribute which belongs to all the natural kinds, *and to these only*, so that we have no material ready to hand out of which to form a name for our projected class. It clearly will not do to take any one of the attributes which are conjoined in the kinds which we wish to connect, since by our supposition each one of these attributes belongs also to a certain number of natural kinds which have none of the other attributes. Therefore no true proposition can be

stated in universal form with regard to the presence or absence of each of the remaining attributes in each member of a class which is named by virtue of possession of any one of them.

Obviously, one way out of the difficulty is to take some attribute which is common to *most* of the kinds which have the attributes we have noticed, and which, moreover, belongs to no other kinds. We may, then, without danger extend the use of the class-name thus formed to a few adjacent kinds which have not indeed the attribute which nominally forms the connecting link between the kinds and binds them into a class, but which have all the other attributes which are combined in these latter kinds. In this case all the universal propositions which we can formulate of the artificial class in the narrower and more proper sense, as containing only those kinds which have the attribute which gives rise to the name, will be equally true of the class in the wider sense as including those natural kinds which, though resembling in the possession of several common attributes, have not the special attribute in question. The improper use of the name is a matter of small importance, since as we have seen that name soon comes to suggest to us, not the attribute on which it was founded but merely some or all of the classes which it ties together.

Symbolically. Let attribute P belong to kinds A B C

D E F G; let Q belong to A B C D E H I; let R belong to A B C D E K L. Then we should call as before those kinds which have P, p; those which have Q, q; and those which have R, r. But neither p, q, nor r will form convenient artificial classes, since we cannot say either that all p is q, nor all q is p, and so with the rest. Suppose now that there is an attribute S which belongs to A B C, *and to those only*, then it is obvious that if we call A B C, s, because they possess in common the attribute S, then s will so far be a convenient artificial class that we shall be able to make at least three true universal propositions with regard to it. We can say All s is p, All s is q, and All s is r. But P Q R may also be truly attributed to D and E, which do not properly belong to the class s, since they have not the attribute S, on which that class is constructed. If however, we arbitrarily extend the use of the name to kinds D and E, we shall still be able to make the same three true universal propositions as before with regard to this extended class. This I apprehend we do more frequently than is ordinarily imagined, though, as in our original instance, the process of the extension of the use of the term is usually gradual and unperceived, as new kinds are one by one discovered which have a number of qualities in common with all the members of an already existent artificial class, but have not that special quality which gave a name to the class.

But that this method of forming an artificial class is both clumsy and unscientific must at once be granted. Men of science have accordingly been loath to resort to it, and whensoever they have had any hand in the formation of an artificial class, have adopted another expedient, which although quite as artificial as that which we have just been talking of, has this not extremely important advantage, that it avoids a somewhat improper use of language. Their procedure is on this wise.

Every ideal picture of a kind or individual consists of a number of parts which unite to form one complex notion, but which as they are themselves different are capable of receiving separate names and frequently do receive them. Thus my ideal picture of a man comprises a trunk, two arms, two legs, a head, etc. Now each of these parts has always or almost always been seen in conjunction with the rest, therefore it is difficult if not impossible to conceive any of them separately. Even in those cases in which we have observed a portion of the body separated from the remainder, that portion has not really been the same to the eye that it was before separation. Samson must have had a very full conception of headless trunks, but the guillotine in each case exposed to view a new and hideous picture, and the executioner's idea of the trunks so presented to him must have been utterly unlike that of the body as

it appears while the head is still on it, even although the idea of the head itself be kept in the background as much as possible. The same remark applies to the surgeon's notion of a separate limb, or that which an ordinary man might get by an anatomical model. It always contains some new portion which in no way belongs to the limb when attached to the body.

We may then admit that of the detached portion of any whole picture of an individual or kind, we have no idea except as conjoined with the rest of the picture. Nevertheless we have separate names for each of these separate members, and may use these names for the formation of artificial classes in cases where a certain portion of the whole picture recurs in several otherwise dissimilar kinds which we wish to connect because they have several attributes in common, but cannot call by a name derived from any of these common attributes, since, as in the case which we have already discussed, each one of the attributes belongs also to other kinds to which none of the rest do belong. The names Quadruped, Biped, and a great proportion of the terms of botany, as Polypod, Pinnate, etc., are formed on this principle.

Now if, as we have seen, we can form no conception of a living and unseparate leg except as belonging to some animal we have seen or have a notion of, it follows necessarily that it is even less possible for us to form a

mental picture of animals with four legs in general other than that of some special animal which we know. The name Quadruped is useful just in the same way as Animal was in referring us back to our experience and making us run over a list of all the four-legged animals we have seen. Like the other general names of which we have talked, it is merely an artificial link for tying together classes. To put the matter for a moment in logical phraseology, its whole value lies in its denotation, not in its connotation.

We have now arrived at what I believe to be an exhaustive list of general names of natural objects, and have discovered that they may be divided into four classes. They are—

(1) General Names of Natural Kinds, whereof we can form a mental image more or less distinct.

(2) General Names of Artificial Classes which tie together several natural kinds by means of some attribute which they all have in common.

(3) General Names of Artificial Classes which tie together natural kinds by means of an attribute which belongs to the greater portion of those kinds, the name derived from that attribute being extended for convenience' sake to several kinds which have not that attribute.

(4) Names of Artificial Classes which combine natural kinds by means of a truncated portion of the

mental picture of each of the several kinds; which portion is common to all these kinds.

Of the definition of the first class of General Names we have already treated. The three other classes have, I apprehend, no natural definition; the name calls up at the moment no image whatsoever in the mind. But as it immediately sets us thinking to what kinds it is properly or conventionally applicable, the proximate though not immediate mental state aroused by the name is an enumeration of the kinds which are contained in the class. This enumeration then is that which will best stand in the place of a definition. Since however these classes are expressly formed for the purpose of binding together kinds which have several other attributes in common, it is important to mention at the time of giving the definition what those attributes are. This forms no portion of the definition, since except to the scientific man the name will not usually suggest either immediately or proximately these other common attributes; yet seeing that the class was only formed by reason of the concurrence of these attributes in several kinds, he who merely gives a definition of the class without mentioning the common possession by all its members of some or all of these several attributes, conveys no knowledge of any value to his hearer.

Of the definition of the complex emotions we have already spoken. That of activities is usually and best

performed by means of the mention of the successive appearances of the agent during the various parts of the activity and of the appearance of the result. Almost all other words represent, not one mental picture, but several (for instance, Justice in one sense gives us successive pictures of a crime and its punishment). All these are defined by being resolved into their simpler elements—a process which often requires the greatest skill and knowledge, but which involves no new general principles.

CHAPTER III.

OF TRUE PROPOSITIONS.

A PROPOSITION asserts the connection or repugnancy of our ideas. A true proposition in the fullest sense asserts such a connection of ideas as is in accordance with our past experience.

Now ideas may be connected in such a sort as to form one complex mental picture. Every one of these ideas will appear simultaneous with the rest and be indissolubly connected with them. We may form propositions then asserting this simultaneity of ideas, or we may break up the whole picture into the simpler elements of which it is composed. Thus we may say Gold is yellow, and gold is shining. Such propositions which separate off portions of a complex mental state and use those portions as the predicate of the name of the state, that is, affirm one or more elements of the picture to be true of the picture as a whole, are called Analytic. The most important of such analytic propositions are Definitions of which we treated in the last chapter, and which affirm the sum of the separable

elements to be true of the mental state or picture treated as a whole, *e.g.*, the Skye terrier is from four to six inches high and from twelve to fourteen long, it is usually either grey or blue-black with dropping ears, and long silky hair, which in perfect specimens altogether covers the eyes.

But by far the larger and more important part of our communication of knowledge to each other consists not in the mere description of things, but rather in the statement of some more or less obscure attribute which we have discovered or heard of, and which seems important to the happiness or comfort of the Human Race; as for instance, that morphia injected into the veins produces sleep, or that the rapid evaporation of water from the surface of a champagne bottle in a hot sun will cool the wine within. Now an attribute, as we have seen already, is some quality of the thing which forms not part of our first experience, nor is invariably present to our senses whenever that thing lies before us, but which we have had experience of whenever that thing was placed in a certain definite relation to us. Nettles have the attribute of stinging, but only they are made painfully aware of this attribute who incautiously and lightly place their hands upon them. We probably have each of us personally made discovery of this attribute at least two or three times in our life, but no one has repeated this experience as often as once for every thousand times

that he has seen a nettle. It follows then, as we said before, that when the name of anything is mentioned, the notion of its attributes arises not at once in the mind, but merely that of its appearance. The several ideas of its attributes come after in irregular order and number according to the varieties of the experience and reading of each individual.

Propositions which assert the possession by anything of a given attribute, or more generally the connection of two ideas which are not simultaneous, but succeed each other in the mind after a more or less appreciable interval, we call Synthetic. Ninety-nine sentences out of every hundred which we use in conveying knowledge of any kind to our fellowmen are Synthetic propositions.

In this chapter we shall confine our attention exclusively to this latter class, and shall enquire how far the forms of proposition ordinarily in vogue are fitted to convey true and accurate information from man to man. We must first, however, hark back over some of the country we have already passed through, if haply we may thus get a fuller scent of our quarry.

We have said more than once before, that a true proposition is that which arouses in another the same state of mind as that of the speaker himself, with the further proviso that that state of mind exactly represents the speaker's experience (that is, that there is in him no abnormal failure of memory, nor vagary of fancy).

But even as that would be but a poor copy of a picture, which exactly reproduced the colours but neglected entirely to observe whether they respectively occupied the same space and were brought out into the same comparative prominence as those of the original; so is that a poor verbal representation of the state of our mind which merely states that we have certain ideas therein, but omits altogether to mention which is the most vivid and important, and how they lie with respect to each other. Now in giving a definition of any natural kind, a subject which I have investigated at a length which I fear must have reached the extreme verge of my reader's patience, we saw that all the less constant and less marked parts of the picture were excluded altogether, and there remained the description of a limited number of ideas which appeared conjointly on every occasion of our experience of the object, and which therefore would be represented in the mind by ideas which would be equally vivid but for differences in the relative size and importance of those parts of the thing they respectively represent. These differences may be made apparent by the definition itself (as when we say that the legs of the Skye terrier are short and those of the greyhound long); so that we may contentedly conclude that in this case speech fulfils satisfactorily the task imposed upon it, and that the mind of the hearer may be made by a careful definition satisfactorily to reflect that

of the speaker. But with Synthetic propositions the case is far otherwise.

In order that I may know in what relation a thing and its attribute stand to each other in the mind of any other person, I must not only form proper notions both of the thing and the attribute, but I must also be able to appreciate in some way the ease and rapidity with which the notion of the attribute follows in his mind that of the thing. If he tells me that such or such a dog is savage, I am yet far from knowing how closely the image of the dog is connected in his mind with the notion of attempts to bite. This connection will be the result of his experience, and it is that experience which it concerns me to share. At present I have merely a vague idea that on certain occasions (number and attendant circumstances unknown) the dog has attempted to bite people, but what will be the chance (as represented by the experience of my friend) of the beast's flying at me if I enter the yard, I have little means of estimating. In this especial instance my fears will probably induce me to put a very high estimate on the closeness of the connection, in my friend's mind, between the idea of the dog, and that of his attacking people. The same exaggeration is often produced by hope, with regard to pleasurable attributes.

Nor is the matter at all improved if, instead of statements about individuals, we take general truths about

kinds. That all Tigers are savage, and all Wolves are savage, are both indisputable, or at least sufficiently accurate, statements, and the word 'savage' may be used with precisely the same meaning in both, that is, as equivalent to 'prone to attack man,' yet before either proposition can convey any thought to me, I must attribute some definite strength of connection to the two ideas contained in that proposition; I must imagine the rapidity and ease with which my informant passes from the idea Tiger, to that of attacking man, and so too from the idea Wolf to the same attribute. Now, if I attribute an equal strength to the connection in each of the two cases, I shall obviously be mistaken, since wolves require a much stronger incentive to attack man than tigers do; yet there is nothing in the form of the two propositions to induce me to make any distinction between them.

Other things being equal, the rapidity with which I pass from the idea of a thing to that of any one of its attributes, is in exact proportion to the number of times that the experience of the thing has been followed by the experience of the attribute. We may put the same statement another way, and say that our expectation of the presence of the attribute, when we encounter the thing, is in exact proportion to the number of cases when we have already followed that order of sensation of which we have at this moment got the first member.

The mind passes on either from the perception of a thing to the idea of some attribute which has frequently been observed to belong to the thing, or from the mere idea of the thing to the idea of that same attribute.

It is possible that the passage of thought from sensation to idea which constitutes expectation, is much more rapid than that from idea to idea, which is represented, or sought to be represented by propositions. But the rapidities, if not equal, are at all events proportional to each other; a more vivid expectation of the attribute on the sensation of the thing, corresponds with a closer connection between the idea of the thing and that of the attribute. The two mental sequences owe their origin and force to the same cause, the frequency of the connection of the sensations. They will, therefore, necessarily both wax and wane together.

If we have noticed instances where the thing being presented to our senses, and all other conditions being apparently the same, the supposed attribute did not follow, our expectation of its occurrence at any future occasion when we perceive the thing will be lessened, and if there be several such cases of failure of the appearance of the attribute, our expectation of its presence or absence when we see the thing, will be the result of the balancing together of the positive and negative instances, supposing always that no single instance is so closely connected with any strong

emotion, as to count for more than its real value. It follows from what we have already said, that the connection of the idea of the thing, with that of the quality or attribute, will also be in accordance with this balancing process.

If, now, there be any natural kind, of which and of whose attributes I have a sufficiently full experience, and I am speaking to another person whose experience has been similar to mine, but whose memory I wish to refresh, or whose attention I wish to fix on a given point, what form of proposition shall I most naturally use? It seems clear that the simple mention of the names of the thing and the attribute will suggest in his mind a connection between the two exactly like that which exists in mine, our experiences being similar. I shall say to him, 'You know that Dons are priggish,' or 'You are aware that sheep are liable to the foot and mouth disease,' and shall feel confident that within narrow limits, the closeness of connection between the subject and predicate in the two sentences respectively, will appear to him much as it does to me. It is true that I might with accuracy prefix the word 'all' to the latter proposition, and it is to be hoped that I could not properly do the like to the former, but the addition or omission of this word will in no way help or hinder his understanding of my statement, while it is itself open to grave difficulties, with which I shall deal more fully

hereafter. The form which seems most proper to use in such cases is that which I have adopted, and which is almost invariably employed by sensible men in the common transactions of life, when speaking of affairs with which their audience are already acquainted. It is true that logicians have branded this form of proposition with the terrific epithet 'Indesignate,' and warn us all never to use it under penalty of their severest displeasure. But not all that the logicians reject is chaff, neither is all that they accept corn.

Yet, after all, the advance we have made is but a little one, and moreover is hardly in the direct line of our enquiry. The statements which we have noticed are not intended for, nor capable of, the communication of knowledge; they merely serve for its revival and excitement. Knowledge is only then communicated when the speaker brings into the mind of his hearer a conjunction of ideas different from any which existed there before. Our task is to enquire how far it is possible for one person to arouse in another a state of mind corresponding to his own, when that other has not himself had the sensations described in that especial order which the speaker wishes to arouse.

Imagine, then, that a friend tells me that 'The Ostrich in the Desert lays her eggs in the sand.' Now I may have a perfectly accurate notion of the ostrich; I may either have seen it in some zoological collection,

or have studied pictures of it; or, at worst, my friend's description of it may have been so full as to enable me to construct a tolerably accurate mental image of the bird. I have in all probability seen ostrich eggs, and can easily conceive them lying upon the sand, but as I have never had the opportunity of observing the ostrich nor of finding its eggs in the sand, I know not how closely these two observations are connected. I have no natural tendency before hearing the statement to pass from the notion of the ostrich to that of the eggs in the sand, nor can I at all estimate how strong is that tendency in my friend's mind; with what degree of ease and rapidity he passes from one mental picture to the other. Yet it is this knowledge which it is all-important for me to possess.

If my friend's knowledge were entirely derived from his own experience; if the ostrich had been an entirely unknown bird until he travelled through the desert, his best chance of making me fully understand his state of mind as attempted to be expressed by this proposition, would probably be to inform me directly of the amount and nature of the experience upon which this conjunction of ideas was founded. He would tell me, 'I have found ostrich-eggs in the desert so many times, and in each of these instances, or in a certain proportion of these instances, I have noticed that these eggs were placed in the sand.'

Of course, in order that his experience should have any value, there must in each instance be ample opportunities for the bird to lay its eggs elsewhere than in sand, on rocks, etc. If he had only met the ostrich in absolutely sandy deserts, the notion of living in sand would form part of the picture of the ostrich (at least as a necessary background), and the proposition would become, 'the ostrich which lives amongst sand lays its eggs amongst sand,' and would really only be synthetic as far as concerned the statement that the ostrich lays eggs, since the notion of pervading sand would form part of the original picture of the ostrich, and would not be an attribute or subsequent sensation to which the mind would be carried on after an interval by the men tion of the name.

I should then take the positive instances to represent a rapidity of mental transition in proportion to their number, and the negative instances (if any) to weaken and retard this transition in similar proportion.

But against my informant's adopting this course in practice there are strong objections. In the first place, he is probably by no means the only observer of the ostrich, and the connection in his mind between the idea of the bird and that of the eggs laid in the sand, is the result not only of his own experience but of accounts of other travellers which he has heard and read, and it is this net result which he is anxious to

impart to me. Secondly, the number of experiences which he himself has had is likely to be so great that he cannot exactly remember the number of instances either positive or negative. This will clearly be the case when he is talking of a matter of daily observation, as that the sun in India is more distressing when shining through clouds.

In all such cases he is obliged to resort to another and far less satisfactory method of communicating his thought. He gives up all attempt at communicating to me the positive and most important element upon which the connection of ideas rests, to wit, the amount of the experience, the number of times that the sensations have been conjoined. He is content to impart as far as he can the negative element in the formation of the mental connection. I mean the occurrence or non-occurrence of contradictory instances; where all other things remaining the same, the experience represented by the first idea has not been followed by that represented by the second. If there has been no contradictory instance in the experience of himself or others, he says (to return to our former instance), 'All ostriches lay their eggs in sand;' if there have been contradictory instances, he says, 'Some ostriches lay their eggs in sand.'

Let us now examine closely how much information he has imparted to us by either of these sentences. We

will begin with the former and more promising of the two, the universal proposition, 'All ostriches, etc.' How far on hearing these words can I simulate in myself my informant's mental condition? I begin hopefully; I form separately the two conceptions of the ostrich and the eggs in sand, and attempt to bring them together and establish a connection of a certain force between them. But of what force is this connection to be? If my friend's experience and that of his informants be small, the connection will be weak and the passage of the mind slow, and it may vary through all degrees of rapidity and strength. His words, however, have given me no information on this point; he merely tells me that he knows of no contradictory instance. His information as it stands is really about as valuable as that of one who should tell us that there was nought to be deducted from a sum of money which he would pay us for a piece of work, but should altogether abstain from informing us what that sum of money was.

But supposing my friend's information to be given with regard to some point which will directly or indirectly affect my welfare, I am naturally anxious to make something definite out of it. Moreover I have a natural abhorrence of doubt. This abhorrence is easily explicable. The ultimate object of all knowledge and all enquiry is action—such action as will sustain the lives and maintain and increase the happiness of our-

selves and those dear to us. Now this life and this happiness, as both physiologists and theologists are agreed, consist in bringing ourselves into accordance with our circumstances. If, then, one phænomenon be given us as a sign of the approach of another phænomenon, for which it behoves us to put ourselves in preparation—if the rapid fall of the barometer betokens a storm—he will live best and most naturally, and will be most able to provide happiness for his friends, who is ever on the alert for these natural signs—passes rapidly in thought from the sign to the coming event which it betokens, and prepares himself most suitably for that event. Now doubt is the slow and difficult passage of mind between two ideas. He who doubts acts not at all, or acts tardily, and the event which he should have foreseen and guarded against overtakes him utterly unguarded, or in the midst of his unfinished preparations. 'Who doubts is lost,' is in many instances Nature's law as truly as it is that of any Church.

But although this abhorrence of doubt is historically and in the long-run of most beneficial tendency, yet in certain instances, and specially in that which we are now considering, it frequently betrays us into the most grievous errors. Let us see how it will act upon us in the case before us.

My informant has made a statement to me which I am anxious to put into such terms as may make it most

useful for my guidance in the affairs of life. Now if I suppose that his experience of the two phænomena has been very wide, it will follow that, since (as I know) there are no negative instances, the connection between the two ideas will be very close, that is, that he will pass very quickly from the one to the other, there will be an entire absence of all doubt, and he will act quickly and with decision in cases where action is called for. This would obviously be the most desirable state of mind to be in supposing that it were warranted by experience. I therefore, arbitrarily assume a very wide experience on the part of my friend and his informants, and a very close consequent connection between the phænomena.

Moreover, in my absolute absence of information as to the comparative strength of different mental connections which are described in the same form, I am forced either to suppose that all are of the same closeness or to allot the degrees of closeness in the different cases at the dictates of pure fancy. Yet from all we have said it is clear that in the original observers the connections between the ideas of divers sets of phænomena will vary very greatly in strength. The same man might tell us that 'all sharks live in water, and that all ostriches lay their eggs in sand,' but he would be considerably more surprised if he saw a shark moving quietly and comfortably about on dry land than if he saw an ostrich deposit its eggs on a rock. Now surprise

is the shock occasioned by the experience of an order of phænomena which is in contradiction to a connection hitherto observed and established in the mind, and is in exact proportion to the strength of that mental connection. We on the other hand, supposing that we had absolutely no knowledge of the phænomena in question except that which had been furnished us by our friend's words, should regard the walking shark and the egg lying upon the rock with an exactly equal amount of astonishment—a result which proves that his use of the doubtful or rather negative word '*all*,' and our arbitrary interpretation thereof, had not enabled us in any sufficient fashion to imitate his state of mind with regard to the phænomena.

Suppose that having heard from a traveller one of these accurate but vague general statements as to some animal, say the ostrich, I am placed in circumstances where knowledge of the habits of the bird is important to me, I shall probably accept his statement as implying a very close connection between the thing and the attribute—the bird and the laying eggs in the sand. If I lack other food I shall explore most carefully wide tracts of desert, omitting of set purpose all investigation of tracts of rock, or even of herbage, and I may thus chance to miss the eggs on which my life depends, and which, breaking the most common wont of its race, the ostrich has in this instance

deposited in those neglected spots. Our original informant, whose expectation of finding the eggs in the sand was determined directly by his experience, and was therefore in this instance small, would doubtless after his first fruitless search in the sand have turned to explore the remaining spots, and would have found that which he sought. Yet his information, which was the best which he could give us, by reason of our interpretation of it, will have frustrated the great end of all information, the preservation of life.

Nay, cry the logicians, it was his information and not the interpretation which was at fault. He had no right to make the general and sweeping assertion on such a small amount of evidence. He should merely have said that in the experience of himself and his informants, the occurrence was invariable. What, I ask, does the word All signify more than an invariable experience of eye-witnesses? You answer that it asserts further that all future cases will conform to this rule. That it asserts (or rather suggests) an expectation of future occurrence of similar experience I willingly admit; in fact, the observation necessarily follows from our analysis of expectation. But that it can assert anything more than expectation of a greater or less degree with regard to a future which is not yet but is to be, I absolutely deny.

On this matter I shall have much more to say anon.

But, assuming my statement granted, that every proposition which states an experience may also suggest an expectation, we can, I think, solve the question of the proper use of the word 'All.' For since expectation is the passage of the mind from a sensation to an idea, expectations can only vary in the rapidity of the passage. Now, this rapidity passes through all stages, from the electric quickness which we call certainty, to the slow and hesitating progress which is Doubt. The greatest rapidity is the result of extensive and uncontradicted experience; the extreme of Doubt is reached when the confirmatory and contradictory experiences nearly balance each other. Between these two extreme points there is a gradual ascent, with no definite break or halting-place.

It is not even necessarily the case that an uncontradicted experience creates a stronger expectation than any contradicted one. My expectation that this shilling which I hold in my hand will pass current is stronger than the expectation that I shall see to-day pass before my window the same old couple who have passed every day since I have been here. The former, however, is a contradicted experience, since I have met with bad coin in my life whose spurious nature I have failed to detect till I attempted to change them; the latter is an absolutely uncontradicted one. After deducting, however, the negative instances of bad coin from the

positive ones of good, the balance of experience, and therefore of expectation, remains far stronger in favour of the shilling being good than that which arises from the uncontradicted experience of the daily passing couple.

Since then there is no definite amount of expectation which will warrant the use of the word 'All,' for every proposition which suggests that amount, and forbids its employment for such statements as are intended to convey a less amount of expectation, we must look elsewhere for some distinction which will enable us to justify the use and rejection in the respective cases of this universal prefix (all). I can find it only in the *quality* of the experience, that is, in the fact of its being or not being uncontradicted. For all uncontradicted experience, whatsoever its amount, I prefix the term 'All' to the statement of that experience, for all contradicted experience I omit it. I affirm that all ordinary men unskilled in the niceties of Logic do the like.

But since, as we have seen, mankind are prone to affix a very high estimate to the amount of the experience represented by the universal proposition; it is but natural that when the experience is really of a low amount they should expect to be warned of the fact, and thus saved from those errors into which their eager disposition is apt to lead them. When the universal

proposition represents an experience which, though uncontradicted, yet consists of a small number of instances, it behoves our informant to declare that this is so. If he do not we shall be sure to pitch our expectation far higher than his experience warrants. This is the real meaning of those warnings against rash generalization with which the books of logicians and men of science abound. The warning, however, should rather be against rash expectation, and should be addressed to the hearers rather than to the speakers. If once men would get firmly fixed in their minds the fact that the word 'All,' if it is to have any definite meaning whatsoever, can only state the absence of contradiction, and in no way the amount of experience; they would in every case, when they heard any universal statement of whose evidence they were in doubt, closely examine the speaker as to the number of times that he or others had met with the experience in question, and as nearly as may be adjust their expectation to the information thus obtained.

It is this purely negative meaning of the word 'All' and the arbitrary positive value which men attach to it, that gives such overwhelming weight to the Negative Instance. Bacon long ago pointed out that any universal proposition was absolutely overthrown by the experience of a single case in which the expectation failed, and the statement proved untrue. But he failed to

point out the reason of this total downfall, neither could he have succeeded in discovering it without some such laborious analysis of the meaning of the word 'All' as that through which we have waded.

Let us consider for a moment the state of mind of a man who, having had heretofore little or no experience of any given thing, suddenly meets with an attribute of this thing contradictory to some universal proposition which he has received from others. Having learnt that all tigers are savage, he comes across a perfectly tame tiger in a wild beast show. Now if he had himself before met with a number of savage tigers, or knew roughly how wide was the experience of his informants, the effect of this new experience on him would not be very great, the contradictory experience would have to be deducted from the sum of affirmatory experiences, and his expectation that the next tiger which he might see would be savage would be less, but not very much less, than it had been before his meeting with the tame tiger. But he is in no such enviable position; he has supposed beforehand (and in this case rightly supposed) that the evidence on which the universal proposition was founded was very great; but has formed no very definite notion of its amount. When the contradictory experience comes he is therefore totally unable to compare this one experience with the large number of experiences on the other side. He begins to suspect

that perhaps after all, the instances when his informants, and those from whom they have got their knowledge, have seen a tiger are very few, and that the proportion between these instances and the negative instances, of which he has experienced one, is not one of great inequality. He is thrown at once from the height of fancied certainty into the abyss of doubt. Great then is the power of the Negative Instance, and great must it ever be, while language remains such an imperfect instrument for the conveyance of thought.

It was to obviate this danger that Bacon invented that celebrated Scientific Induction which was to take the place of the old method of enumeration of instances, and lie high above the reach of the onslaughts of the all-destructive Negative Instance. This induction variously *improved* (?) and systematized, is that which now occupies the Schools; but as it concerns itself chiefly with the discovery of causes rather than with the observation of attributes, it may be most conveniently dealt with when we have discovered the nature of a cause and the pretended law of Universal Causation. Meanwhile we may contentedly assume that, subject to any discovery which we may afterwards make as to the sovran virtues of the New Induction, no universal proposition taken by itself and without further knowledge on the part of the hearer, can enable him to represent to himself the state of mind of the speaker.

We have now to deal with that second class of propositions which do not even assert that the experience of the speaker has been uncontradicted, and examine how much information is to be got out of them by the hearer. We saw that Universal Propositions only gave us one of the two elements required to form an expectation, to wit, the absence of contradiction, omitting the other and perhaps more important element—the amount of the experience. We shall find, I fear, that these other propositions with which we are now concerned give us neither of the two required elements. As the word 'All' was the sign of uncontradicted experience, so is the word 'Some' of contradicted experience. Whenever I assert that some A is B, I mean to convey to my hearer the belief that there have been cases in which A's have shown the quality expressed by B, and that there have been, or at least that I expect there have been, cases in which A's have not shown that quality. In this statement, as in many others, I am at variance with the ordinary Logic books, but I appeal to the consciousness of the plain and candid man uncorrupted by having his thoughts forced through a mould, to confirm the truth of these and all other of my statements. At all events I am in accordance with the Logic books in calling all those propositions in which the word 'Some' occurs 'Particular.'

Let us take, then, any Particular proposition, such as

this, 'Some camels can perform a march of a hundred miles in a day.' This informs me that in the narrator's experience there have occurred cases in which a camel has been seen to do a hundred miles in the day, and beyond this it asserts, or at least suggests, that he has met with camels which are incapable of achieving such a feat. The statement gives no information whatever as to the proportion between the two classes of camels.

Now suppose having heard this statement, I meet with a particular camel, in what respect is my knowledge of him increased by what I have heard, or what expectation shall I form of him in consequence? My narrator's statement may have meant that one hundred out of every hundred and one camels could march a hundred miles a day; or again, it may have meant that only one in a hundred could do so. There is nothing in the words to suggest either one thing or the other. It is true that as a matter of fact I should extract some expectation out of the words, but I should do so either by means of previous knowledge or by that of illegitimate assumptions. Suppose, for instance, I had before met with and heard of no camels which could do more than sixty miles a day; the statement would destroy the expectation that sixty miles would be the maximum limit of any particular camel's daily journey, and would prevent me from feeling great surprise if it performed eighty or ninety miles, but it would enable me to form

no legitimate expectation as to the chance of its doing so. Again, I probably know or assume that there is not any very great difference between the paces of different animals of the same species, and combining this knowledge with my informant's statement, I assume that if camels have done a hundred miles a day I may safely expect that the one before me will be able to cover fifty. Yet, if having heard that some horses could go at the rate of thirty miles per hour, I should expect to get fifteen out of a cart-horse, I should doubtless meet with a grievous disappointment.

This at least we may say, that except as qualifying or supplementing a universal proposition, particular propositions are of no avail for the communication of knowledge. I believe, however, that in practice we usually limit the use of the word 'Some' to propositions where the positive experience falls short of, or at least does not exceed, the contradictory instances, employing by preference the more explicit word 'Most,' for cases in which there is a clear preponderance of confirmatory experience. If this usage were universal we should have two classes of particular propositions, the one of which would have the affix Some the other the affix 'Most.' The former would represent cases where the balance of the experience was negative, and where we should, therefore, rather expect the absence of the attribute than its presence. In the latter class the

balance of experience would be positive, and we should expect, though with varying degrees of assurance, the presence of the attribute. Both classes of propositions would be liable to the objection that they gave us no knowledge of the absolute amount of the balance of experience in each case, but this drawback they would share with Universal propositions. Since, however, the ordinary usage of mankind is not quite fixed on this point, a new and easily avoidable element of confusion is introduced by the use of the word 'Some.' 'Most' is unobjectionable from this point of view, since it clearly means more than half or a balance of experience on one side. We require an equally definite word for less than half or a balance of experience on the other side. 'Some,' of course, would serve admirably for this purpose were it consistently employed in this sense only.

If the course of reasoning which we have followed throughout this chapter be conclusive, we must draw the necessary consequence that no meaning whatsoever can be assigned to such expressions as Absolute Certainty, Immutable Truth, etc. A mental proposition may no doubt be absolutely true, so long as it refers only to my experience and accurately represents that experience. So long, that is, as my faculties of memory and sensation are in perfect working order, and I pay due attention to their reports. But the moment I

attempt to put this mental proposition into words, or to conceive to myself the exact value of some statement of another, all this possibility of accuracy vanishes away. I must be content if I can make my hearer's mind correspond to mine in the roughest and vaguest manner, and after like sort must I hope to attune myself to the mental state of any of my informants. Absolute uniformity I can never hope to attain.

Yet again, Truth is chiefly if not solely valuable in relation to expectation. I wish to represent to myself the nature of the conjunction of two ideas in my informant's mind, in order that, when the sensation of the thing, which the first idea represents, is brought before my consciousness, my expectation of the appearance of the attribute which the second idea represents may be as strong and no stronger than that of my informant would be under similar circumstances. Now strength of expectation and rapidity of passage from sensation to idea, or from one idea to the other are, as we have already seen, but two sides of the same thing. Since then, there is no meaning to be attached to the words absolute strength or absolute quickness, neither is there any signification whatever in the phrase, Absolute Certainty. Certainty is extremely quick progress from one idea to another (or from sensation to idea), so that 'absolute certainty' can mean nothing more than absolute quickness, that is, can mean nought whatsoever.

That there are degrees of certainty even in cases where the word 'certain' is ordinarily and properly used will be fully evident by the application of that test of surprise whereof we have already made use. A man would say that he was certain that he had seen a friend yesterday, and again that he was certain that if he dropped his whip from his hand it would fall to the floor, yet his surprise, if it could be proved to him that his friend had not been in the place where he imagined that he yesterday saw him, and that he must therefore have made a mistake as to the day or as to the person, would not be nearly so great as that if he dropped his whip and saw it suspended in the air without visible support.

When the quickness of the passage of thought between two ideas is very great, the fact that the ideas are successive and not simultaneous, becomes scarcely discoverable, and the time occupied in passing from one to the other being infinitesimal is unnoticed. We then call the connection between the two ideas certainty. But that there are degrees in this infinitesimal time is clear from the fact of the varying amounts of surprise in cases of frustration, real or imaginary of various certainties. This surprise is in exact proportion to the amount of the expectation or quickness in the passage of thought. If then the surprise varies, so must the respective certainties, and no one of them can ever become absolute.

All that has been said as to the vague and misleading

character of universal and particular propositions with regard to real natural kinds applies with tenfold force to those propositions which make assertions of any sort about those wide artificial classes which tie together a number of these natural kinds. The propositions are, in fact, mere short-hand forms for making in one sentence a number of detached statements. My assertion that 'no quadrupeds have reason,' does not really imply an incapacity of my mind for passing from the idea quadruped to the idea rational, since in fact I have no idea of a quadruped at all, as we have already proved. What it does assert is, the incapacity which I feel for passing from the idea of any kinds of quadrupeds which I know, or have heard of, to the notion rational. It is to be analysed into a number of separate assertions of the form 'No Dogs have reason,' 'No Horses have reason,' etc.

Now in the first place the negative universal proposition stands in exactly the same difficulty as the affirmative universal. Every time that I have met with one phænomenon without meeting with another increases my difficulty of passing from the idea of one phænomenon to that of the other, and yet the negative proposition gives in its form no knowledge of the number of instances in experience of the absence of the attribute. It therefore fails to impart any conception of the difficulty of passing from the idea of the thing to

that of the attribute—of the strength of my feeling of the repugnancy between the two. If we take that repugnancy to amount to absolute impossibility of bringing the two ideas together in thought, then we fall into the same error which we exposed in the case of certainty. Two ideas may be very easily conjoined, or they may show the greatest aversion to being brought together; but as long as the two ideas are really two and not merely the same, or on the other hand one idea and its negation, there can neither be absolute necessity for nor absolute impossibility of their mental conjunction.

If we were dealing with a real simple proposition, such as No dog is rational, this would be the whole of our difficulty; but in this instance which we have chosen, we have got bound up together a number of detached propositions, representing very various amounts of expectation. Thus, that no horse is rational, and no pig is rational, is supported by so wide an experience, that the difficulty of conceiving rationality as belonging to either of these beasts, rises to a height which in rough language may very fairly be called impossibility; but when we come to less-known kinds, the difficulty becomes less in exact proportion to the decreased amount of experience. I am conscious of no equally great difficulty in attempting to conceive a rational beaver, and little or none in imagining that the centaur may be rational, if such an animal there might

be. Other little known animals I do, indeed, conceive as irrational, but this arises from their similarity to some known irrational animal with which I, to a great extent, confound them in thought. But in order that the statement that No Quadrupeds are rational, should convey any due impression to our minds, we must combine all the separate expectations of the irrationality of each of the separate kinds of quadrupeds. Now mathematicians tell us that if there be a number of independent expectations, which amount nearly but not quite to absolute certainty, the chance of their all being fulfilled is comparatively small, even when compared with that of the least likely of them. So that the chance of no quadruped having reason will be much smaller than that of the irrationality of all beavers, or of any other kind whatsoever. In other words, our proper expectation of the fulfilment of any statement as to an artificial class, should be much less than that of the correctness of the same statement with regard to any individual natural kind in that class.

I pray the candid and non-logical reader to omit the paragraph in brackets. I pledge my word that it contains nought which makes towards the main subject of inquiry.

[The discussion which we have undertaken in this chapter may throw some light on the logical question of the Import of Propositions. From what we have

said, I think it is clear that every proposition aims at conveying the notion of a connection between two ideas, that is, it aims at arousing in us a mental proposition, wherein both subject and predicate are used in intension. But since it is important to convey not only the fact of the connection of the two ideas, but also some notion of the strength of the connection, and as this strength depends upon the amount and nature of the several experiences; the proposition attempts to convey a portion of this knowledge by stating whether all the instances have been one way or not, by the use of the words 'All' and 'Some' respectively; by thus referring the mind to the individual instances, it may be said to use the subject in extension at the moment of the communication of the knowledge, though the ultimate object is the conception of a purely intensive connection between Subject and Predicate. Lastly, Propositions with regard to wide Artificial classes, use their subject always in extension, but not in the fashion usually imagined. They refer the mind to the individual natural kinds, between which the subject serves as an artificial link. It is with relation to kinds, and not to individuals that the subject of such Proposition is in Extension.]

We have seen then, gentle reader, that no single statement such as those which we ordinarily use, is capable of conveying an accurate notion of the state of

the speaker's mind, still less of the experience on which that state of mind was founded, and which is to us in most cases, the all-important thing to know. No one statement can be precisely true, according to our most proper definition of the word Truth. But the sea of doubt into which this discovery seems to plunge us, is neither so wide nor so deep as it at first appears. We are often able to form fairly accurate guesses of the amount of experience on which any statement rests, and by comparing one experience with another, and all with our own experience, to assimilate to ourselves the knowledge of others in such rough but sufficient fashion as shall render life possible. Moreover, in a great number of instances, and those by far the most important, the experience on which the general statement rests is so wide, and the consequent connection between the ideas so close, that thought passes from one to the other with that imperceptible rapidity that we call certainty. Now, although we have shown that in this so-called 'Absolute Certainty' there are really degrees of strength, yet the shades are so slight and imperceptible, that no great harm is done by mistaking one for the other. I may be a trifle more or less certain of a statement than my original informant; my mind may pass from one idea to the other with more or less rapidity than his, but as his mind passes from the one to the other with a rapidity so great as to be imperceptible,

and mine does the like, the difference between our mental states is extremely unimportant.

So far, then, we have swum through one great wave, and have discovered the imperfections of language without being reduced to Absolute Scepticism as to the value of all Human Knowledge. We have shown that Truth, in the most proper sense of the term, is never exactly attained in ordinary discourse, but may generally be approximated to sufficiently for the well-being of mankind. We have now to deal with Truths in the Scientific sense, those, to wit, which are expressly intended as prophecies of coming events and phænomena. These prophecies may all be said to consist in the foretelling of effects by means of the observation of causes, either immediately or after a long chain of arguments in which causes and effects constitute all the terms. The discussion of the Nature of the Relation between Cause and Effect, and the means of the discovery of this Relation is the most important portion of the task immediately before us. Let us hope that this discussion may lead us to results no more damaging to the security of Human Knowledge than the inquiry which we have lately completed.

CHAPTER IV.

ON CAUSE AND THE LAW OF UNIVERSAL CAUSATION.

ALMOST all those who have hitherto discussed the subject with which we have now to deal (and surely their name is Legion) seem to me to have confused, or at least to have refrained from clearly distinguishing two entirely separate questions. The first of these questions is, What is the connection or relation between phænomena, in virtue of which we call the one a cause and the other an effect? The second is, What is the notion which men ordinarily form of that connection or relation? The distinction is a sufficiently obvious one, and in almost all other enquiries is readily understood. Thus no reasonable man would think that the enquiry as to the nature of the force which keeps the earth and the other planets in their position, was identical with the investigation of the meaning which men ordinarily attach to the word weight; though no doubt the true explanation of weight (the real attribute I mean, and not our vulgar idea of it) would also be a true explana-

tion of the principle which governs the motions of the sun and planets.

Of course it is open to any man to assert that we have a full and true notion of the connection called Causation, and if we grant his assertion, the two questions will at once become one, since the knowledge of the common notion will also be a knowledge of that which this notion truly represents. This is the position occupied by Brown in his 'Inquiry into the Relation of Cause and Effect,' where he attempts to prove both that a cause is an inseparable connection between phænomena, and that the notion which we form of causation or power is merely that of inseparable connection. The same identification of the two questions is effected by the School of Reid and Hamilton, who without stating with any great definiteness what they understand by Causation, yet assert that all mankind have an immediate and infallible conception of the nature of a cause, so that here also the thing and the idea of that thing coincide.

But it behoves the so-called Sceptical School, who assert either that mankind have no notion of causation, or that that notion is an imperfect one, to investigate quite separately each of these two questions, and to compare the answers obtained, in order that they may be able to point out in what respects, if any, the common notion of cause differs from the correct con-

ception of its nature. Yet no one writer of this School seems to have treated the matter quite satisfactorily according to this criterion. Hume in his treatise on 'Human Nature,' and again in his 'Essays,' is chiefly concerned with the question as to what *our idea of Cause* is, or more frequently, what it is not. The answer to the entirely separate question, What is a cause? is either assumed or but very slightly glanced at. I shall attempt to keep these two questions entirely separate throughout this enquiry. If we discover that to each of the two the same answer must be given, our confidence in the credibility of the conclusions of the undisciplined mind will be put on a firmer basis. If, on the other hand, our two answers differ widely, we shall at least be saved in future from the error of supposing that they are identical.

Our first question then is, What is that connection between phænomena or sensations which constitutes the one a Cause and the other an Effect. But before attempting to solve this question, we must first get an answer to another and more simple one. Does the connection exist between the things themselves independently of the presence of a thinking subject who perceives them, or does it lie only between phænomena, that is the things as they affect our senses, and is the connection merely one which the mind has added to the phænomena? To put the question in another and perhaps more compre-

hensible form, Does Causation exist in the external world, or is it merely the result of some active power of the mind which establishes for its own convenience connections between phænomena? To this latter question we answer boldly. The connection between the phænomena is the work of the mind and the mind only. A cause is merely that which the mind selects as a sign of the coming of that other phænomenon which it calls an effect. An effect is merely that which the mind chooses as a sign of the past existence of a cause. That this selection is entirely arbitrary I do not of course intend to assert, but that it is to some extent so, I think we shall see as we proceed. I pray the reader not to be staggered by the apparently paradoxical character of our statement, but calmly and dispassionately to judge the reasoning upon which that statement is founded. Thus only will he act as a lover of Truth, our common mistress.

Before, however, proceeding to our demonstration, it will be well to clear away one doubt which may naturally have arisen in the reader's mind. We saw, in the last two chapters, that an attribute is a phænomenon which appears to our senses subsequently to our perception of the thing, and separated from that first perception by a more or less distinguishable interval of time. We saw, too, that the presence of the thing awoke in a greater or less degree the expectation of the

attribute—the sight of a rose at a distance arouses the expectation of smelling it as we approach. Now when we say that a Cause is merely the sign of the Effect, we obviously mean simply that the cause is that thing or phænomenon whose perception will arouse in us an expectation of the perception of the Effect.

It seems, then, that our definition of causation differs in no way from that which we have before given of attribution, and that, according to our statement, it matters not whether we say such and such a phænomenon is the effect of such and such, or that the former phænomenon is the attribute of the latter. Such a result is, however, obviously at variance with consciousness. We cannot but feel that when we assert that one phænomenon is the effect of another, and when again we declare that an attribute belongs to a thing, we mean to express entirely distinct conceptions by the two forms of statement. Wherein, then, does the difference lie? Merely in this, that we can conceive the cause to be removed and yet that the effect should remain, whereas we cannot for a moment imagine it possible that a thing should be removed and yet that its attribute should be still present to our senses.

It may thus happen that the very same sensation may be considered either as an attribute or as an effect, according as it is or is not imagined as capable of endurance after the 'thing' or the cause is removed. Thus

weight is unquestionably an attribute of any book, and we are only made directly conscious of this weight by the feeling of pressure on some portion of the body, as for instance, the hand. Now this feeling of pressure may endure a short time after the book is removed, and in this case we no longer say that we feel the weight of the book on our hand, but that we retain the feeling of pressure *caused* by the book. The weight of the book and the feeling of pressure are here two names representing the same sensation, but the former is regarded as inseparable from the book we see, and the latter as capable of separate existence.

We saw before that the visual appearance or picture which forms our notions of the thing endures throughout our experience of the attributes of that thing. Any sensation then which we experience after the appearance of the thing is removed from our eyes, and which yet frequently or constantly follows the perception of that thing, we call not the attribute but the effect of that thing. In the same way one attribute of a thing may be said to be the cause of another attribute, if the two attributes frequently follow each other in consciousness always in the same order and the latter endures, or is imagined capable of enduring, after the former has vanished. An attribute then may be the cause of another attribute of the same thing, as when we say that guilt is the cause of remorse, or of

some change in some other thing, as when we affirm that ill-temper produces dislike, or lastly, and in but few cases, it may be the cause of some thing in the proper sense; Heat of the air produces a mist. A thing may either be the cause of another thing, as an acorn of an oak, or of some change in that other thing, as fire of the melting of wax. (It may be said that we should more properly assert that the heat of the fire was the cause of the melting of the wax, but I shall attempt to prove further that either expression is equally proper as it is equally usual.) We can never properly say that a thing is the cause of any of its own attributes, nor do I think that we ordinarily attempt to do so, although philosophers have for some inscrutable reason been always extremely anxious that we should adopt this form of expression.

The clear difference between Attribution and Causation lies then in this, that the attribute must always be simultaneous with the thing, while the Effect must always exist, or be conceived as capable of existing, subsequently to the removal of the cause. There may be many cases in which, as a matter of fact, causes are usually concurrent with their effects, but I defy any one to mention any effect which he cannot conceive as existing after its cause is removed, or any attribute which he can conceive as present to his senses after the thing of which it is an attribute has vanished from consciousness.

This being the distinction between Causation and Attribution, it is easy to see that they divide between them all the connections of phænomenæ which give rise to expectation.

There are, no doubt, other relations and conjunctions between phænomena, such as their identity, similarity, and contrariety, but none of these give rise to expectation of any kind. To explain this absence of expectation conjoined with some sort of conjunction of ideas would be a task which, though by no means difficult, would carry us too far afield.

Meanwhile we may be content with the assertion that Causation and Attribution are the only two connections between phænomena which are of the slightest value in man's mental code of signs. If a man perceive either of the two signs, which we call a Cause and 'a Thing' respectively, he at once expects the subsequent appearance of an Effect or an Attribute, as the case may be. The only difference between the nature of the expectation in the two cases being that in the former he does not necessarily believe that his present sensation will endure throughout the time that he experiences the expected sensation, whereas in the latter he does necessarily assume the endurance of the present sensation of the 'thing' during the whole time that he shall experience the expected Attribute.

Up to this time we have merely been explaining the

purport of our strange assertion that Causation was a connection established by the mind between phænomena. It remains for us to prove that assertion. This, perhaps, we shall best do by the historical method. Let us imagine the noble Savage as altogether divested of all inherited tendencies of thought and cast suddenly into the world with all his senses and his newly-awakened Reason in working order, but with absolutely no knowledge except that with which each successive moment furnishes him. We shall then be able to solve the question as to whether Causes already existed in this world of which he was the first rational occupant, or whether, strange as the statement seems, he placed them there by degrees.

It must be allowed that our conception of this ideal savage is, in all probability, historically speaking, an inaccurate one. If we accept the theory of the Evolution of Species, we must grant that many of the tendencies of man are to be traced back far down the scale of organised life, and were evolved slowly and imperceptibly out of rudimentary states of consciousness of which fully developed man has entirely lost count. It may probably be that the grouping of phænomena, considered as signs of future sensations, into the two big classes of Causes with their Effects and Things with their Attributes was prior, historically, to the evolution of man. Without doubt the distinction was not a sudden

step forward, but a gradual development, of which the intermediate steps are long since forgotten. Yet the history of the imaginary Savage, which we propose to study, will represent with sufficient accuracy the actual progress of the Race through countless centuries.

We suppose, then, this creature with all the faculties but without the experience of man, placed suddenly in the midst of the universe. He would first have merely a bewildered consciousness of constant changes. He would behold only a wild flood of meaningless phænomena sweeping past him with horrible rapidity. But if this creature is to survive a week this state of terrified bewilderment cannot long continue. He must adjust himself to his circumstances, neither can he do so effectively unless he be able to anticipate phænomena before they arrive. In order to achieve this he must observe that certain phænomena are usually followed by other phænomena, so that if he perceives the first he will in most cases be right in putting himself in readiness for the second. He will then be able to arrange the most common phænomena into pairs, whereof the perception of the first will lead to the expectation of the second. A much later stage would be that, where from the perception of the second he would be able to infer the prior or simultaneous existence of the first—would be able to argue from effects back to causes. Later for two reasons. First, because life would be possible and not even

greatly increased in difficulty if the perception of phænomena which were usually subsequent in experience did not immediately suggest to our minds the prior existence of those phænomena which in other similar cases had been antecedents, since no immediate action would in most cases arise from such backward thought from effects to Causes, and immediate actions are those with which thought is in the first instance concerned; secondly, by reason of the difficulty of thinking in inverted order of sensation, a difficulty which would only in fact be got over when having experienced the properly subsequent phænomenon, the Effect, he were afterwards rendered conscious of the fact that the Cause had existed previously or simultaneously. In this case the Cause, although prior or simultaneous in order of existence, would be later in order of sensation or consciousness, and thus the difficulty of thinking in inverted order would be overcome.

But we have been anticipating; we have at present only got up to this point in the history of our Savage; he has arranged all common phænomena as far as may be into pairs, but has not yet made the distinction between Causation and Attribution. How he is impelled to this further step we have yet to see. We have assumed throughout—and surely the assumption is an allowable one—that the chief object, conscious or unconscious, of our savage is to adjust his actions to his

circumstances and to render his life as secure and free from pain as possible. Now it would be important for him to notice that there are certain phænomena which only followed other phænomena after some action of his own, whereas other sequences of phænomena occurred entirely independently of any motion of his. Thunder followed lightning while he lay still on his back watching the cloudy sky, but fire only proceeded from a dry stick whenever he chose to rub another stick against it. Generally speaking, we may say that the attributes of the thing are only made known to us by some action of our own, but that effect follows cause while we remain passive. The distinction, then, would soon be made between those sensations which were signs to the savage that he might, if he liked to perform certain actions, experience some other sensation, and those which were signs that he must experience the sensation whether he would or no.

Now although I say and believe that it was the distinction between sequences of phænomena which would be completed independently of himself, and those which required action of his own, which suggested to the mind of our Savage the division between Causation and Attribution, yet must I confess that the two lines of division are by no means parallel. For instance, it is an attribute of the tiger to devour oxen, and he will perform that function without any action whatsoever

either of the oxen or of their keeper. But in the first place, by far the greater number of things are immovable and none of their attributes (except in rare instances that of smell) will be experienced by the man who perceives them without some further action of his own. In the second place, with regard to animals or moving things, it was not the immediate attribute but some subsequent sensation of the man which was usually forced upon his notice. The action of the jaws of the lion or tiger was not that which concerned the savage, but his own subsequent loss of his sheep or oxen and consequent hunger. Of such subsequent sensations the animal was the cause in the strict sense of the word. If, as we shall attempt to show later on, the *original notion* of Causation is closely connected with that of animal action, we shall have no difficulty in understanding how it may have been that the divergence between the two lines of separation which we have noticed, remained long unperceived, and that the distinction of Causation and Attribution, on the one hand, from independent and conditional sequence of phænomena on the other is due to a much later development of the human Reason.

The gradual progress which we have attributed to our Savage and his tentative groupings of phænomena into the pairs of Cause and Effect, Substance and Attribute, is precisely the history of the work of Science

from the beginning of the world until now. She is ever rejecting signs which she has found are less often than others followed by the thing whose expectation she wishes to arouse, or which, for other reasons which we shall discuss later, are less convenient than the new signs which she substitutes for them. But while she is continually destroying causal links and forging new ones, she modestly asserts that she does nothing but discover. How arbitrary are the processes by which she manufactures some of her signs we shall see in the chapter on Induction. There too we shall prove at length that however carefully Science may choose her signs, yet must they always be inadequate to the variety of Nature. There also we shall attempt to explain how it is that we regard some sequences of phænomena as causal and others as merely casual, and what is the exact meaning of this latter word.

We have now explained and I think proved our assertion, that a causal connection is an arbitrary link manufactured by the mind of man to connect phænomena. But an objection may be raised which as far as it goes has some weight. A man might say, I admit that the ideas of the phænomena are connected in the mind, but this is not the whole truth, nor is this what I mean when I say that the phænomena are selected as Cause and Effect. According to your own theory the connection of the ideas in the mind arises from, and is

proportional to, the occasions on which the phænomena have been connected in experience. It is this connection in experience, and not the mere connection of the ideas, wherein I consider Causation to exist.

I may remark that experience in this sentence means precisely the experience of man, and that this experience of man can never be the measure of the universe. Moreover the experience of any two phænomena can give us information of those two phænomena, and those alone. It can tell us nought of any phænomena in the future. The only way in which the fact that phænomenon A has followed phænomenon B in the past is connected with any future sequence of similar phænomena is through my ideas. A and B, as external phænomena, having passed are absolutely at an end, they have no power or weight whatsoever, but my idea of the sequence between A and B remains, and when I encounter a new sequence of similar phænomena, A′ and B′, I am aware of the resemblance between this new sequence and the memory of the old one, and henceforth the conjunction of the ideas which represent A and A′, and B and B′, respectively in my mind will be closer. It is in the mind, and in the mind only, that the conjunction is permanent. That between external phænomena is destroyed on each occasion with the destruction of the phænomena themselves. The objection however may be so far admitted as to induce us to modify slightly our definition of Cau-

sation. The connection between Cause and Effect is not strictly speaking arbitrary when we are dealing with natural and ordinary sequences of phænomena, though it is still purely mental. We shall see further on that this qualification is not nearly so important as it at first appears, and that most of the causal links manufactured by Science are purely Arbitrary.

The Doctrine of Causation which we have laid down above is at variance with two theories very much in vogue among philosophers. The first is that which asserts, that a large number of causes unite together to produce one effect. The second declares the Absolute Uniformity of Nature, and upon that Uniformity founds its theory of Induction. These two theories are more closely connected than might appear at first sight, and I shall therefore examine them together. In order that we may accomplish this task satisfactorily we must start with the statement of the Definition of Cause as it is propounded by the philosophy most in vogue.

"A cause," says Mr. Mill (here following Brown), "is merely the invariable unconditional antecedent of any phænomenon. It is, properly speaking, the sum of all the conditions, positive and negative, which being fulfilled, that phænomenon will necessarily and in all cases appear." According to this statement, a fall from the window is not, strictly speaking, the cause of my breaking my neck, but only a part of the cause. The

whole cause includes the law of gravity, the construction of my flesh and muscles, the hardness of the pavement below the window, and a host of other facts. These are the positive conditions, and how many there be, who can tell? but the negative ones are yet more numerous, and, indeed, are literally infinite. The fact that I cannot fly, that no one caught me in his arms, that the air is not buoyant, are a few of the most obvious of these negative conditions. Now as this infinite number of conditions, positive and negative, can never be stated, it follows that we can never state the true cause of a phænomenon. But, says Mr. Mill, it is only necessary to state each and every of the positive conditions of the appearance of the phænomenon, the negative ones being assumed to be fulfilled in every case. The sum of the positive conditions, together with the implied but not expressed negative conditions, will be the true cause of the phænomenon. Let us see whether this modification of the doctrine will be of much avail to him.

At the moment of any phænomenon coming into being there are existing at any given spot, where the observer may be placed, an innumerable number of other phænomena, of which he notices the most salient or the most unusual, but leaves unnoticed the less marked and those to which he is well-accustomed. Then, says Mr. Mill, whenever the phænomenon is presented, we notice as

many as we may of the phænomena immediately preceding its appearance. When next the same phænomenon appears we again notice the precedent phænomena, and find that a certain portion of them are common to the former case. We perform this operation on several occasions, and find that on each of them a certain number of phænomena (or perhaps one only) recur as antecedents of that phænomenon whose cause we are investigating. We perhaps go further than this and observe a group of phænomena which in all its more salient points resembles some one of those groups which have been followed by that phænomenon whose cause we are seeking to discover, but which lacks precisely those phænomena (or that phænomenon) which we have discovered to be a constant factor in all our previous experiments where the effect required has occurred. We now find that in this new experiment the effect does not occur. Are we now warranted in asserting that these phænomena which were present in our former experiments, but are absent in this latter one, are the cause or invariable unconditional antecedent of the phænomenon which has always followed them in our experience, and vanishes when they vanish? Mr. Mill says, decidedly, Yes.

In order that this assertion may have any logical basis we must assume two principles. The first is that Nature is Uniform; that is, that phænomena follow

each other in an invariable order. This principle Mr. Mill attempts to prove, and we shall examine his proof shortly. But we will now turn to the second of his two assumptions, which is equally necessary for the support of his argument, and which he tacitly assumes without endeavouring at all to substantiate it. If the group of phænomena A, B, C, D are all those which are observed or observable as preceding phænomenon Z, and in another case A, G, H, I also precede phænomenon Z, while neither B, C, D nor G, H, I alone are followed by Z, then, supposing Nature to be Uniform, we may be justified in asserting that A is the invariable unconditional antecedent of Z.

But do we ever get such a simple experience as this? I assert that we neither do nor can. Our real experience is after this fashion: we have in one case A, G, H, I, and an infinite number of other phænomena, noticed and unnoticed, followed by Z, and in another A, B, C, D, with also an infinite number, followed also by Z, while B, C, D and G, H, I, each with their infinite train of companions, are not followed by Z.

Now, the question is, What logical right have I to assume that A, K, L, M, with its infinite chorus, will be followed by Z? That I shall expect it to be so followed is obvious, since A is a cause of Z, in my sense of the word as well as in that of Mr. Mill. But, whereas I should only be moderately astonished at A not being

followed by Z, with a kind of astonishment which, varying in degrees, I experience almost every day, Mr. Mill would cry out that a miracle had been accomplished, and the order of Nature reversed.

And yet to the ordinary mind it does not seem that anything so extraordinary has occurred. Assuming the ordinary notion of Causation as an indissoluble connection between phænomena, it may have been that in each of the cases in which Z followed, there was an unobserved phænomenon R, which was the real cause of Z, while in cases in which Z did not occur it was absent, and it was also absent in the group of phænomena A, K, L, M, etc. Moreover, even supposing that A were the cause of Z in this sense, it might well happen that some of the unnoticed phænomena in the group A, K, L, M, etc., might be what is called a Counteracting Cause. Of the real nature of these so-called Counteracting Causes I shall treat fully in my chapter on Induction, but for the present it is sufficient for us to notice that as long as our experience be given us in this involved chaos of phænomena, we have never a logical warranty for asserting that any one phænomenon will necessarily be preceded or followed by any other, although our expectation of this sequence may rise to almost any degree of strength.

The value of Mr. Mill's Inductive Methods is simply in the increase of expectation which they cause by, as

it were, isolating the phænomena, and fixing our attention on those only which will form, according to our past experience, the most convenient signs. Nought could give absolute Logical validity to Mr. Mill's methods except the assumption, either that this infinity of unnoticed phænomena is fixed in every case, or that the unnoticed phænomena in no case influence the result.

As to the former assumption, the exact reverse of it is true. Out of the infinite variety of phænomena which combine to constitute one moment's experience, we may safely assert that all are never again repeated together in precisely the same proportions. As to the second assumption, we need only say that it is never capable of proof, and is often obviously untrue. Many of those causes which are now considered most potent are phænomena which, till within the last few years, were absolutely unnoticed. Who, fifty years ago, would have looked to infected milk as the most fruitful cause of typhoid fever?

"Nay, but by experiment, we can really isolate the phænomena, or introduce into a thoroughly known state of things a change perfectly definite." That you can get rid of a great number of variable phænomena I readily admit. But who shall drink the sea dry? After all your most careful eliminations, an infinity of phænomena is with you still. Place an apparently simple substance under a receiver, exhaust as far as you can

all the air, insert some other apparently simple substance or gas, and watch the combination. Which of you can tell what may be the subtle chemical influence of the materials of the glass, or the effect of the diverse composition of the rays of light which penetrate the vessel? I speak not of the previous history of the two substances, and the chance that what now seems to you simple may some day be proved to be composite. All these matters are doubtless themselves subjects of experiment, and may one day be discovered and calculated. Yet who can stale the infinite variety of Nature? For each phænomenon which we investigate and check off she meets us with a multitude of new phænomena whose existence we had hitherto neither observed nor expected. Believing this to be the case, we assert that no cause in the sense demanded by Mr. Mill's definition has ever been, nor ever will be discovered.

Let us now return to the examination of the sheet-anchor of this theory of Induction, the doctrine of the Uniformity of Nature, that is, the assertion that in all future time from precisely similar antecedents similar consequents will ensue. Most of those who have propounded this doctrine have held that it was an ultimate belief, itself incapable of proof, but the acceptation of which was necessary if we were ever to attain any absolute certainty about the external world. Mr. Mill,

however, is bolder than his predecessors; he asserts that this Law, upon which all Induction rests, is itself an Induction.

It might seem strange to the unsophisticated hearer, if we were to say to him, "I beg you to notice, that unless the Law of the Uniformity of Nature be true we have no security of the truth of any Induction, and also to observe that the Law of the Uniformity of Nature is itself proved by Induction." He might naturally object that in order to prove this Law to be true he would have, according to the explanation of his informant, first to assume it to be true—to prove it, in fact, by means of itself. Mr. Mill is quite sensible of the possibility of this objection, but the method in which he meets it is, to say the least, curious.

It is because of his anxiety to prove that all our knowledge is got either from Sensation or from Induction that he will not allow the Law of the Uniformity of Nature to stand unsupported as an ultimate belief or portion of knowledge. How, then, is the Law to be proved? It is obvious that we do not learn it immediately from sensation; it remains that it shall arise from Induction. But does not this Induction itself require the assumption of this Law? Perhaps not in all cases. Scientific Inductions, where we attempt to isolate the phænomena and establish an unconditional sequence, do certainly derive all their validity from this Law. But there is

another class of Inductions, which are more commonly employed by the vulgar, which are performed by merely enumerating the instances of a phænomenon occurring, and being followed by some other phænomenon, without any attempt at isolating either the former or the latter phænomenon, and proceeding from this enumeration to assume that the one phænomenon is cause and the other effect. Now these Inductions by Simple Enumeration, as they are called, do not require the assumption of the Law of the Uniformity of Nature, for the simple reason that they do not fulfil its conditions, and are, therefore, incapable of being supported by it. In the use of this Induction we make no attempt to prove that all the antecedents are the same in any two observed cases, and therefore have no ground, according to the Law of the Uniformity of Nature, for expecting a uniform consequent. Mr. Mill, therefore, in common with all logicians, from the time of Bacon downwards, looks upon such Inductions with the greatest suspicion, and warns us that we can never hope by means of them to establish true Laws of Nature, and that the use of such inductions renders us immediately and peculiarly liable to the overthrow occasioned by the discovery of a single Negative Instance, a danger from which he believes his own scientific Inductions are entirely free.

Are we, then, to establish the law upon the validity of which all Scientific Induction rests by means of a method

which the propounders of that Scientific Induction reject as invalid and dangerous? This seems a startling proceeding; yet hear Mr. Mill: "The precariousness of the method of simple enumeration is in inverse ratio to the largeness of the generalization. The process is delusive and insufficient exactly in proportion as the subject-matter of the observation is special and limited in extent. As the sphere widens this unscientific method becomes less and less liable to mislead; and the most universal class of truths, the law of causation [*i. e.*, of the Uniformity of Nature], for instance, and the principles of number and geometry, are duly and satisfactorily proved by that method alone, nor are they susceptible of any other proof." (Mill, 'Logic,' book III., chapter xxi., section 3.)

I would ask any disciple of Mr. Mill to explain to me from whence we get the knowledge of the principle, "That the precariousness of the method of simple enumeration is in an inverse ratio to the largeness of the generalisation." It certainly is not given us directly by sensation. Neither can we get it by Induction, since it is itself the foundation of all valid Induction, whether simple or scientific—of simple Induction directly—of Scientific Induction by means of the Law of Universal Causation, whose certainty is said to be dependent upon it. It must then be an ultimate belief or fact in knowledge; but it was just because we would not admit the existence

of such ultimate beliefs that we set about to prove the truth of the Law of Universal Causation, or the Uniformity of Nature. If our original assumption has broken down and we must assume some ultimate belief, it would surely be better to assume at once the Law of Universal Causation, which is simple and intelligible, and moreover commonly accepted by mankind, than to attempt to prove it by the equally unprovable assumption of the very elaborate and doubtful law which we are asked to accept on the *ipse dixit* of Mr. Mill.

We have now arrived at this point—That the Law of the Uniformity of Nature is unprovable, and that if it be accepted at all, it must be received as an ultimate belief which lies at the root of all knowledge, and of the truth of which we are directly conscious. Against this latter doctrine we might bring forward all the arguments which Mr. Mill and his fore-runners of the Sensational School have insisted upon, as proving the non-existence of any beliefs other than those derived from Sensation or Induction.

But a simpler course than this lies open to us. The principle of the Uniformity of Nature in strictness asserts this and this only, That any phænomenon will be repeated if all the preceding phænomena be precisely repeated; since from what we have said it is clear that we cannot decide whether any of the multitude of unnoticed phænomena makes for or against the result, and

therefore, whether the absence or change of any of them will affect that result. But, as we have already shown, the whole of the phænomena present at any one moment, are never (or can never be proved to be) exactly repeated at any subsequent occasion; therefore, if the only valid connections between phænomena are discovered by the observation of such never-existent exact uniformity, we shall be able to get no connections whatsoever, and the world will again be reduced to the chaos of disconnected sensations from which man's mind forced it to issue.

The fact is that we can never answer the question whether or no Nature would do the same thing again under precisely similar circumstances, because we never again meet with those precisely similar circumstances. The Law of the Uniformity of Nature is only not untrue because it is absolutely unmeaning. Nature moves and man's mind moves to keep pace with her. The world around him becomes ever more complex, the relations of life ever more bewildering, and correspondently with this increased complexity is the number increased of those ideal connections between phænomena which enable man to act decisively and quickly, though they do not always enable him to act in such a fashion as will best adapt him for the coming phænomenon, since his expectation can never be free from all danger of error.

The only uniformity which exists at present and has

existed for a long term of years is a rough uniformity between man's adaptive power and the gradually increasing complexity of his universe. That such a Uniformity will always continue, or that it will continue beyond to-day, no man has any right to assert. Nature sometimes moves gradually forward, at others she takes great leaps. If such another leap be made, as in all probability may have been made before, mankind will suddenly be rendered unable to adjust himself to his circumstances, and will vanish from the planet, as other species have done before him, by reason of like sudden changes. But the proximity or remoteness of such a change concerns him not one whit. What it behoves him to know is that which tends to the extension or welfare of his life and species, and since, in the event of such a great and sudden change that species would disappear, he may safely presume some such rough uniformity as we have indicated, since it is only as long as such uniformity exists that thought or knowledge is of any value to him.

It may perhaps be urged that from the point of view of Pure Scepticism we have no right to assume that any such change as I here anticipate would necessarily be followed by the extinction of mankind, since this is in fact assuming the ordinary doctrine of Causation at the very moment we are arguing against it. The objection is perhaps a valid one if the statement be looked upon

as a prophecy of fact. But this at least we may assert, that man existing under an entirely new set of circumstances must be thought of as an entirely distinct creature from him whom we now know, and conceive with surroundings which are the same in essentials for all members of the species. Such a potential future Man we can in no way represent in fancy, nor consequently take any interest in his well-being or misery. And this assertion is all that is necessary for a practical justification of all science and all action upon expectation.

But the upholders of the theory of the Absolute Uniformity of Nature have yet another stronghold. They affirm that their maxim is but another way of stating the universal belief That the Future will resemble the Past, and that without this belief all action would be meaningless and impossible. We have seen already that if this maxim means that like results will follow in cases which are *in all respects* perfectly similar, then it may or may not be true in some world where we get exact repetitions of *all the phænomena* which constitute the complex experience of any one moment, but that in this world it is simply unmeaning. So far from the Induction by which, according to Mr. Mill, we arrive at this law being one of the widest of any and depending upon the most extended experience, it is precisely that of which we have not a single particular instance. If all Induction rests merely upon this support, then truly is the position of Science

hopeless, and universal doubt the necessary consequence of any analysis of the groundwork of our beliefs.

If, on the other hand, the principle be brought down to the convenient roughness of every-day life, and it be said that 'In our investigations of Nature we have usually observed that where the great majority of noticed antecedent phænomena are like those in some known cases, the sequent phænomenon in the new case resembles that which we have met with in the previously observed case,' the principle is true but too cumbrous and too vague for any practical purpose; since we do not habitually observe, nor as I assert need we observe all the antecedent noticeable phænomena in order to discover or manufacture a causal link; and on the other hand there are certain cases where the vast majority of antecedent phænomena exactly resemble those which we have noticed in some previously observed cases, and where yet we do not expect the same sequent phænomenon as we have experienced in those cases. Whether we do or do not expect the same sequent phænomenon in cases in which the vast majority of the antecedents resemble each other depends upon certain conditions, into which we shall enquire later; but every case has to be judged on its own merits, and the application of this approximate general principle of the Uniformity of Nature in no case tends to throw much light on the matter.

But there is another sense which may be attached to the statement that, The Future resembles the Past, which, though very far from the minds of these Experiential Philosophers, conveys a truth, and that a most important one. As a matter of fact, What is the Future? Surely not the vague potential Something-to-Come, which is not and never will be, but simply the sum of the ideal states which are or may be aroused in my mind by any present sensation or emotion, and the passage to which constitutes our expectation. The Future is, in fact, a portion of the Present and the child of the Past. If this be the only intelligible meaning which can be attached to the word Future (and that it is so I think everyone will, after a little consideration, admit), then to say that the Future will resemble the Past, or more correctly, that the Future does resemble the Past, is a truism of the most obvious kind.

I must needs foresee that the statements contained in the last paragraph will be received by the majority of my readers with doubt and repugnance; with doubt, because the conception of the Future contained therein, though I believe the only possible one, does not accord with certain expressions common among mankind which seem to have a meaning, although, as I shall attempt to prove, they are mere metaphorical phrases, to which a definite sense could be attached only by the assumption of hypotheses which would at once be rejected as

myths by the vast majority of civilized men; with Repugnance, because the doctrine I have laid down jars, or seems to jar, with certain accepted theological tenets.

The doubt I shall attempt to remove by a further minute examination of the statement in all its bearings. The theological repugnance I may perhaps alleviate, if I cannot altogether remove it, by showing that the opposition between my assertion and the beliefs engrafted in every conscientious mind, is not so great as it at first appears. This much I may safely claim for myself, that as I hold that Reason is but a fallible judge, even in matters of this world, and hath limits set round her on every side beyond which she cannot pass, so I may candidly believe that if there be any other power in man or portion of men—call it Soul or what you will—to which beliefs are spiritually communicated, Reason hath neither power nor right to judge of these beliefs. It is with the Future, as apprehended by Reason according to the laws of Reason, that I am alone concerned.

That our notion of the Future is equivalent to the Sum of all the things which we expect will happen to us, seems at first sight so obvious a truth, as to require no explanation. That expectation (other things being equal) is proportioned to the amount of past experience (as it is in each individual case the result of that experience) is admitted by all psychologists, and has been assumed by us throughout. But when we come to exa-

mine the matter a little more closely, we run across a difficulty. We feel that we require an answer to the question, What is the precise idea or variation of ideas represented by the Future Tense?

I say that Dogs bite, and mean that my notion of dogs has been connected by past experience with that of biting, and remains so connected. The same connection of ideas may cause me to say when I see a savage-looking dog, 'I expect that this dog will bite,' but although both statements rest upon the same connection of ideas, they are obviously not identical in meaning. Wherein, then, does the difference lie? What is that notion of future time which belongs to the latter statement but not to the former?

Perhaps we may get a little light upon this subject by discussing first the easier question of our notion of past time. What do I mean by saying we have a remembrance of a *past* event? The event of course must be the observation of some phænomenon, that is, some change in an observed thing; the notion of the event considered separately will be then merely the idea of the thing followed by the idea of this change in it. But in order that I may conceive the thing as past, and still more in order that I can assign to it a definite position in past time, I must have a remembrance more or less accurate of the events which immediately preceded and followed it, and of the other

phænomena which were simultaneous with it; I must put the picture into its proper setting; in order further that I may estimate how long ago it happened, I must have a vague conception of the number of events which have happened to me since it occurred. Such ordinary events as the periodical eating of meals and going to bed are those by which we most usually judge of distance of time, that is, we calculate it by hours and days. But it has often been observed that when a number of important events have occurred to us in some short space, the comparatively unimportant experiences which preceded them seem removed from us by months or years. That 'One short sweet hour of crowded life is worth a thousand spent in dreams' is true psychologically as well as emotionally. A past event, then, is represented by memory in a setting and with the notion of ideal passage backward over a number of other sensations. On the other hand, the connection of ideas which is represented by a universal proposition stands out quite independently; it has no setting whatsoever, neither is there any passage of the mind over other ideas representing intermediate events.

Now intermediate between these two extreme limits is the notion of the individual future event (and it is to be noticed that all notions of the future, as all memories of the past, are properly individual). It has neither the entire independence of all other ideas

represented by the universal proposition, nor the exact fixity in a frame at a given distance from us which constitutes our notion of a past experience.

Let us take two or three simple future propositions, and analyze them. Suppose I say, 'I think my friend will arrive here to-morrow.' What precise mental state do my words represent? The two most obvious elements of this mental state are the idea of my friend, and the complex notion of his arrival, probably including an idea of my pleasure at seeing him again. But beyond these two chief ideas there is somewhat more; there is the notion of the division of these sensations from me by the lapse of a day. Now, of yesterday, or of any preceding day, I have a definite notion, as consisting of a number of sensations in a given order, whereof some recur daily, but by far the greater part are changeable. If, then, twenty-four hours are to elapse between the present time and my friend's arrival, I conceive the fixed daily sensations which I experienced in the last twenty-four hours as repeated between my present sensations and the looked-for arrival of my friend, and thus push off the notion of his arrival to an ideal distance in my mind. But these notions of fixed events as constituting my day in yesterday's experience and memory were set in a frame by, or themselves acted as a frame for, a number of events which I can in no way insert into my idea of to-morrow, since they have varied

in daily experience; that idea then resembles a picture-frame with divisions in it, but with great gaps where the most important parts of the picture should be. That there must be a number of events to fill up these gaps I am well aware, but I have no means of filling them up myself.

In the same way as there are gaps in my notion of the sensations which must intervene between my present experience and that of the arrival of my friend, so is the ideal setting of the picture of his arrival imperfect. I may, indeed, imagine our meeting to take place in some known spot, and may have sufficiently strong reasons for doing so to give vividness to the imagination. But the attitude and gestures of both of us, the presence or absence of other members of my household, the varieties of dress of one or other—all these, or at least the greater part of them, must be represented by blank spaces in my picture; whereas in the corresponding picture of yesterday's experience all these accessories are represented with more or less distinctness, or at least can be recalled at will.

Let us take now a somewhat vaguer future proposition. Suppose I am a young and rising barrister, and say 'I hope some day to become Lord Chancellor,' or 'that I *shall* some day be Lord Chancellor.' Here the main conjunction of notions is between the two complex ideas of myself as I know myself now, and of the per-

formance of the various functions which constitute my notion of the Lord Chancellor's office, the presiding over the House of Lords, etc. But here, as before, the two ideas and their connection are driven into the background in consciousness, and I only arrive at them after passing rapidly in thought over a number of steps which, although they have not formed part of my personal experience, I have yet noticed as having been traversed by others who have arrived at the Woolsack; the successive promotions to the position of Queen's Counsel, Solicitor-General, Attorney-General, etc. Now between each of these steps there is, in my notion of the case, a great blank of days and years whose length I cannot fully estimate (that is the length, in my notion, for in actual fact the length may be infinite, as I may never become Lord Chancellor at all). Each of these days I imagine so far to resemble the days of my past experience, that it will be full of successive sensations, but I cannot in any way imagine these sensations. I have to leave them blank.

In this case, also, the two central notions have far less setting than in the one which we before examined. It is true that if I picture myself as Chancellor at all, I must conceive my being so on some one occasion, or successively on two or more occasions; I must to a certain extent attempt to complete the picture with attendant circumstances. I shall probably

imagine my first presentation to the House of Lords, or my first speech therein, but the back-ground of the picture in this case will be far vaguer than it was in the other. The number of attendant circumstances I shall be able to imagine, will be less in exact proportion as my past experience of similar circumstances is smaller. The complex picture will be made up of ill-fitting and detached portions, consisting of memories of what I have seen or heard of the appearance and procedure of the House of Lords, and on the other hand more accurate memories of my own style of speaking, and between these detached portions there will be great gaps which my imagination can in no way fill up. It is to be noticed that this future idea, though it is the only one which I can form, must *necessarily* be falsified by experience, even supposing that the hope represented by the words of the proposition be fulfilled. The 'I' who will be Lord Chancellor after a long term of years, will be a quite different person, with different hopes, fears, and ambitions from the 'I' whom I now imagine as sitting on the Woolsack. But that new 'I' is no portion of my Future at this moment. He is an absolute blank to me. He exists not at all.

Let us now take the still vaguer and general proposition. That we shall all die. This proposition, I assert, is future in nothing but the form. It is merely

the ordinary timeless universal proposition, All men die, in another dress. If the notion of time be always got by running over in thought a number of other sensations before we arrive at the sensation remembered or expected (for the process is the same both for the Past and the Future, although it is accomplished more perfectly for the former); then, in order that a proposition may be regarded as future, there must be at least some sensations which thought suggests as intervening between the expected phænomena and our present consciousness. Now we know that people die every moment, therefore thought cannot in this case suggest other sensations which will intervene between our present consciousness and the next death. We only give a real future significance to the expression by a half-conscious limitation of its extension. We think only of the deaths of ourselves and our nearer friends and acquaintance, and push each of these events off, in imagination, to a considerable distance in time by imagining a number of other sensations as intervening between these deaths and our present consciousness. It is true, and we know that it is true, that we and all they may die next moment. But, nevertheless, we expect for ourselves and each of them a greater prolongation of life. Our Future, as it is to us at this moment, gives time to each of them.

By the comparison of these three instances we get the

following conclusions: First, that a proposition in the future tense always represents the conjunction of two ideas which are more closely connected with other ideas than is the case with the ideas whose conjunction is represented by a universal proposition, and less so than those whose conjunction is marked by the past tense. Secondly, that the more individual and near in point of time be the future proposition, the more nearly it resembles a past proposition in mental content. Thirdly, that all the material both for the main ideas and for the accessory setting represented by such a future proposition is drawn from the past.

It might seem, perhaps, as if my explanation of the Future left little or no distinction between a future notion and one which stands out clearly and distinctly from a forgotten past; some detached remembrance of childhood. But the distinctions between the two are several and important. In the first place, in that past remembrance I imagine myself as something different from what I am now; as a child or a young man; I have some notion, however imperfect, of what I was then from memory, pictures, or description; of the future self I have no individual notion whatsoever, though I may apply to it general notions gained from experience of old men, etc. In the second place, in order to go back to this dim past event, I start by traversing rapidly in thought yesterday and last year, notions which have a full

content, while all my future time is vague. In the third place, I have a definite sense of loss of memory, and in many cases of the possibility of its revival with regard to the accessories of the recollection of the past event, but none as to the like accessories of the future notion.

We have now got to deal with some of the difficulties of our theory. These consist chiefly in popular expressions, from which it seems to take away all meaning. For instance, we say that the Future is full of disappointments, that is, often runs counter to expectation. Again, we say that the Future is dark to us, or that we know nought of the Future. Let us examine each of these expressions separately.

The opposition between the first of them and our own theory is merely apparent. The Future, in the sense here used, I hold to be equivalent to the Sum of all expectations. Now, according to our theory, the Sum of all expectations will be the result of all past experience. In this past experience will obviously be included many disappointments of previous expectations. The expectation of disappointment will be joined with all our other expectations, to make up that Sum of anticipation which is the Future, and this, as it seems to me, is the whole meaning of the sentence, which thus on analysis admirably accords with our theory.

The next popular saying, I fully admit, can in no way be reconciled with our doctrine, but neither can it be

made to accord with any doctrine which asserts Human Free Will or Spontaneity to the very smallest extent. It is a statement founded upon the very narrowest Fatalism. It, too, like our theory, regards the Future as already existing, but as existing not in the mind of man but externally to it. It is, in fact, merely a statement of the old slavish theory common to all barbarous races since the existence of the world, but rejected by Christianity as well as by the higher Philosophy, which regards Man as the mere Plaything of the Gods, led by them along a dark and difficult valley, of which he remembers that portion through which he has travelled, but knows nought of that which is yet before him. In this painful pilgrimage he is regarded as a mere passive spectator, unable to alter aught of the evil around him. For if one man can alter a little many can alter much, and the whole fixity of the gloomy valley vanishes. I do not assert that all who now use this expression hold such a crude and slavish theory. The proverb, like many others, probably suggests rather vague emotional associations than any definite ideas, but I do aver that if any definite meaning is to be given to the words some such theory as that which I have described must be accepted.

And this discussion opens naturally the way for the attack in flank, at all events, if not in face, on that objection which I have most cause to dread—that, I

mean, which comes from the side of theology. If my assertion of the non-existence of any Future other than that which exists in the mind of each individual thinking being be held to impugn The Omniscience of God, I answer that the task of reconciling That Omniscience with the Free Will of man has ever been found a hopeless one by the theologians, and that my theory neither increases nor diminishes that difficulty.

These matters are too high for us, and we can but render ourselves dizzy by the attempt to compass them. If, however, anything that I have said be thought in any way to contravert our hopes of future bliss, this objection can only be founded upon a misconception of my meaning. God's promises, which we have heard from our earliest infancy, form part of our past and give rise to expectations. The nature of those expectations is, no doubt, entirely conditioned by our past experience; we can only imagine Heaven as an Earth with all the pleasures increased and all the pains removed. This is all that God's promises directly convey to us. He has spoken to us in such language as we could understand, even as when he inspired Joshua to command the sun and the moon to stand still. We have a further belief, also gathered from God's promises, and therefore from our own past experience, that all our conceptions of Heaven are entirely inadequate. This belief, however, is merely negative; it adds nought to our expectations, but

merely sobers them, and renders them more faint. That that Future which God has not revealed but merely suggests to us, both already exists to him and shall certainly await us, is a doctrine which seems to me to present no speculative difficulties. It may well be that as there is no variableness, neither shadow of turning in God's nature, so neither is there change in his presence. Yet, again, all Christians believe him to be All-powerful, hence every idea which is in his mind now he will infallibly bring into being when it seems to him good.

I know not whether I have done wisely in touching these difficulties even with a light and reverent hand. It may well be that I shall find that men's prejudices are like quick-lime, and that to handle them in any way can only raise them to their full intensity. It may be, also, that I shall rouse the wrath of the theologians by what they may regard as an intrusion into their province. If, however, the few suggestions which I have thrown out may satisfy the doubts of any one man who combines a love of Truth with a tender conscience and a firm faith, I am fully recompensed for any odium I may incur.

Up to this point I have been occupied solely with the question, What, as a matter of fact, is a causal connection? This question I have solved, as I hope and believe, satisfactorily, and the solution is at least so far

in agreement with that given by Hume, that both he and I declare that the causal connection between phænomena is furnished entirely by the human mind and exists not in the phænomena themselves. There are, however, very considerable differences in details; and before proceeding to the second part of our subject—the discussion of the idea which mankind in general forms of the Nature of Causation—it may be well to note carefully what these differences are, and to see how far our modifications of the theory of Hume may enable us to meet certain weighty objections which have been brought against that theory as stated by him.

Let us place the two theories side by side. Hume's theory is this, A causal link is the mental connection between two ideas, or between an impression and an idea, which is due to the force of the habit of thought arising from the invariable conjunction of two impressions in past time. (Hume uses the word 'Impression' in the same sense as we have frequently used the phrase Individual Experience, as equivalent to a single sensation or emotion; an Idea is with him as with us a reproduction of such a sensation or emotion in a fainter degree.) Our theory is that the causal link is a connection which the mind of man establishes between phænomena for its own convenience, the two phænomena having followed each other in past time, but not necessarily either frequently or invariably. Either of the phænomena

are regarded as the sign of the other, but primarily and more usually the Cause as the sign of the approach of the Effect.

Now against Hume's theory of Causation, Brown points out with great force, what in fact Hume himself seems at times to be aware of, that the reference of the Causal connection between phænomena entirely to habit is at variance with experience; that in certain cases we are quite willing to assume a causal connection after a single instance, and that increased general experience usually rather weakens than strengthens our power of believing in a simple causal nexus in any new case presented to us, by making us more fully aware of the variety of Nature. This was a ruinous criticism to the Sceptical Doctrine as it was perhaps rather unguardedly expressed by Hume, but it tells nothing against our theory that a Cause is merely a certain kind of sign, and in fact Brown's remark, when rightly considered, throws a very valuable side-light on that theory.

Why, in fact, are civilized adults less apt to assume (or make) causal connections at first sight than children or savages? Simply because their civilization means little more than this, that they live under more complex conditions, where the first and most obvious signs are not found to be those which are most frequently connected with the effect or thing which it is desired to foretell, and where the frequent necessity for changing

the signs (of which we shall speak later) has induced a reluctance to accept any at first sight. What, again, are the occasions when civilized man is still able to assume (or make) a causal connection from a single experience? Surely they are simply those, whenever the phænomenon, which we call the effect, and for whose future coming we seek a sign, has either never been seen before, or at least, though the phænomenon itself may before have been observed, we have not noticed any phænomenon immediately antecedent to its appearance with which we might connect it. In these cases there is no room for doubt or choice between divers antecedent phænomena, there is only one phænomenon which can by any means be made the sign for the future appearance of the phænomenon under observation, and as mankind tries in every case to get some sign, it must take the only one which has yet come to hand; subject, of course, to future alteration, if increased experience suggests some more convenient sign. In cases, on the other hand, in which the phænomenon has been often observed, and in which there have been several antecedents, but no one of them has constantly preceded the phænomenon, man is aware that no one of these is a convenient or infallible sign, and that his safest plan is to state them all. Even this plan is liable to an objection, since so long as we have got more than one antecedent sign the causal connection is incapable of performing one of its two func-

tions. It becomes impossible to reason backwards from the appearance of the effect to the prior or simultaneous existence of any one Cause. When this is the case Man is conscious of a deficiency which may hinder, in certain instances, his rapid self-adjustment to his circumstances, and will not therefore admit that he has yet found a satisfactory sign or cause. How he tries to remedy this deficiency, and whether the process he employs can properly be called a discovery of a causal connection between phænomena, I shall enquire at length in the next chapter.

We have now to deal with the second half of our subject, the Nature and History of the notion of Cause as it is entertained by the majority of mankind. This discussion, as we pointed out at the beginning of the Chapter is one which should be carefully separated from that with which we have up to this point been engaged, that as to the real nature of the Causal connection. The Problem, as Hume put it, is this, What is the Impression [Sensation or Emotion] from which our idea of Cause springs? The question thus barely stated, in my humble opinion, admitted of no answer, but this was merely because the question itself was based upon a false assumption. Hume assumed throughout that all our ideas were mere reproductions of impressions, so that if he could prove that there was no impression from which an idea of Cause might be copied, he would have satis-

factorily proved that no such idea existed.* Now, as a matter of fact, all our ideas are not barely reproductions of single sensations or emotions. Knowledge is not merely decaying sense. It is that, it is true, but it is also something more. By no means the least important portion of our ideas are those which represent not directly sensations, but relations between sensations, or groups of sensations, arranged in a definite order. We shall try to prove that the common notion of Cause is merely a reproduction of a certain group of Sensations *in a definite order*.

Hume, in discussing the principal sources from which our idea of Cause, or of Power, which he justly assumes to be correlative of Cause, might be supposed to be derived, treats first of the theory that this notion might be gained from our experience of the action of the Soul upon the bodily members. To this theory he answers, 1st, that the connection of the Soul with the body is entirely mysterious; 2nd, that we cannot always move our limbs by our will; 3rd, that anatomy teaches us that there is no immediate action of the will on the limbs, but rather on certain

* In treating of Hume's doctrine of Causation, I have confined myself entirely to his statement of that doctrine in the Essays. This I have felt myself bound to do in view of his repudiation of his Treatise on Human Nature, although his treatment of the subject of Causation in that Treatise seems to me far more philosophical and satisfactory, than the discussion of the same subject in his later work (cf. Hume, Treatise on Human Nature, Part III., Section XIV.).

muscles, which ultimately move the limbs. He adds in a note that the experience of nisus or effort in moving the limbs cannot give us our notion of power, because (*a*) we attribute power to a vast number of things incapable of any effort, *e.g.*, the wind, (*β*) 'this sentiment of an endeavour to overcome resistance has no known connection with any event; what follows it we know by experience, but could not know it *à priori*.' The last sentence of this note is significant. 'It must be confessed, however, that the animal nisus which we experience, though it can afford no accurate precise idea of power, enters very much into that vulgar inaccurate idea which is formed of it.' (Essay XXXIX., section VII., second note.)

Now, what is the object of Hume's Enquiry in this Section? He tells us that it is into the Nature of the *Idea* of Causation, and he is about to prove that we have no idea of it. Yet in this note he talks about the vulgar inaccurate idea of it. The fact is, that in this note he seems to be guilty of that confusion which we are so anxious to avoid, and to mix up the question, What is a causal connection between phænomena? with the entirely different enquiry, What is the notion which men have of cause or power? It may well be that this notion is an entirely inaccurate one, that it does not at all represent the real nature of the connection, but to assert that the

idea is inaccurate in a note or a paragraph which is intended to prove that it is impossible to form any such idea whatsoever, is a slip which so logical a writer as Hume could hardly have been guilty of, had he sufficiently distinguished between these two entirely different questions.

If Hume only meant to prove that men did not form a philosophical or accurate idea of Cause, to what purpurpose was it to enquire at length into the different sources from which men might be supposed to get such an idea? All that could be necessary would be to state what the common idea of the connection was (and that there is such a common idea Hume admits in this note), to compare this common idea with the true nature of the connection, which he states further on in the same Essay (though not so clearly or accurately as in the Treatise on Human Nature), and to show wherein the idea differed from the reality.

As my theory of the origin of our *common* notion of Causation differs not much from that which Hume here rejects, it will be needful to examine his objections in detail. The first of them I profess myself unable to understand. Suppose I say that my notion of Cause is a complex notion of will followed by motion or effect, to what purpose is it to say that no one knows the nature of the connection of the two things, will and muscular action? My notion is merely of the fact of the sequence

of which I am directly conscious, and not of any supposed explanation of that sequence. Of course Hume would not admit the possibility of forming such a complex notion, but the whole weight of his objection lies in the assumption of this impossibility, which is implied but not expressed in his criticism, and which, had it been stated clearly, men perhaps would not have accepted with the readiness with which they must needs acquiesce in the obvious truism, that we cannot hope to discover what is the ultimate explanation of the connection between Soul and Body.

The second objection as to the want of absolute certainty of the obedience of the limbs to the will, can only be of weight against those who hold that Cause and its notion both contain the element of invariability, and not against us, who constantly affirm that the introduction of this element is unnecessary, and only tends to confuse the question.

The third objection amounts to this: 'If it were true that man got his notion of Cause by assuming that the apparently immediate connection which he is conscious of in his own body between will and change or motion, prevails also in the world around him; then when he discovered that the connection between a determination of his will and the motion of his limbs was not truly immediate but mediate, his notion of Causation would be entirely destroyed.' Surely this is rather a

rash assumption. The compound notion formed originally when all men imagined that the connection was immediate, may be continued when the original sequence of impressions on which it was founded is broken for a few persons by the insertion, on some rare occasions, of certain intermediate impressions (as in the case of the surgeon who noticed the action of his muscles as coming between the decision of his will and the action of his limbs). More especially may this be the case if it be true that this notion of Cause, founded on the supposed immediate connection between Will and Motion of limbs, had prevailed and become engrained into the mind of man for thousands of years. The real force of this third objection lies, however, in the same implied assumption which we have noticed with regard to the first—that the formation of such a complex idea, including two or more sensations in a definite order, is impossible.

In the note to which we have already alluded, Hume discusses a modification of the theory which he has criticised above, but I think he hardly states it fairly. No reasonable man would assert that the experience of a *nisus* or effort could by itself give us the notion of cause. The theory should rather be stated in this form. 'Our notion of Causation is a representation of these Impressions or direct experiences, to wit, Will, Effort, Motion *following a regular order*.' Not any one of these separately, nor all in a casual group, but the three in

the order in which they have always occurred, I hold to give us our notion of Power or Cause. Apparently some contemporary or predecessor of Hume held the same doctrine in a more or less definite form. Unless, indeed, both the suggestion and its rejection are due to Hume himself.

Of course this doctrine would at once have been rejected by Hume, since it asserts the existence of a complex idea not due to a single impression; but what other objections has he to urge against it? The first of his two statements (α) comes to this, That if our notion of Power or Cause include animal nisus as one of its elements (he would of course say as the only element), this notion is not properly applicable to many of those sequences of phænomena which we include under the head of Causation. This observation is perfectly true, and we shall attempt to give an explanation of the facts to which it calls our attention, but it at most proves that our notion of cause is not an adequate or philosophic one, that it does not really cover all the cases to which the name is extended. It can in no way help to demonstrate that the notion itself is non-existent.

The second objection (β) only holds against those who affirm that the notion of Cause is an innate and *à priori* one, that is, antecedent to all experience. It can in no way affect those who merely state that this notion is the

reproduction as a complex idea of certain observed phænomena in a definite order.

Our assertion then is that the notion of Cause or Power is a complex idea, consisting of notions of Will, Effort, and Change combined in that order. The assertion amounts to this, that in attributing Causation to all the events of the Universe, we in some vague and but half-conscious fashion consider that every change in that universe is produced by forces like those of which we are sensible in ourselves, and under the same conditions. The problem immediately before us is to explain how it is that this personal (or at least animal) notion of Causation has been so wondrously extended into regions where it has obviously no proper place.

The solution is not far to seek for us who live in the full light of Modern Discovery, though for Hume, who stood upon the outskirts of that glowing plain, the apparent insolubility of this question seems to have been the chief obstacle to his acceptance of the doctrine which we have stated, since in the last words of that note which we have already quoted, he seems almost to concede what we are about to prove, 'It must, however, be confessed that the animal nisus, though it can afford no accurate precise idea of power, enters very much into that vulgar inaccurate idea which is formed of it.' How would it be if it were proved to him that this so-called vulgar inaccurate idea of Power is not merely the only real idea

which we have of it, but also that this idea, even as it exists in the uncorrupted consciousness of the vulgar, possesses not at the present day one tithe of the intensity which belonged to it in the minds of those bygone generations of men to whom all the world was full of gods, that is, merely of men's spirits in other shapes? In those days it was no mere poetical exaggeration, but the sober expression of ordinary belief, to say,—

'You air that serves me with breath to speak!
You objects that call from diffusion my meanings and give them shape!
You light that wraps me and all things in delicate equable showers!
You paths worn in irregular hollows by the road-sides!
I think you are latent with unseen existences, you are so dear to me.
You flagged walks of the cities! you strong curbs at the edges!
You pines! you planks and posts of wharves! you timber-laid sides! you distant ships!
You doors and ascending steps! you arches!
You grey stones of interminable pavements! you trodden causeways!
From all that has been near you, I believe that you have imparted to yourselves and now would impart the same secretly to me;
From the living and the dead I think you have peopled your impassive surfaces, and the spirits thereof would be evident and amicable with me.'

Mr. Tylor has well shown in his book on Primitive Culture, how universal is Animism among savage tribes. By the expression 'Animism' he means the attribution to portions of inanimate nature capacities and feelings somewhat similar to our own. He shows how the savage buries food with his parent, or burns it at his grave, in order that the spirit or ghost of the food may give sustenance to the ghost of his father, even as the real food gave sustenance to that father upon earth.

Even as all savages believe that man's spirit is something different and separable from his flesh, so they also believe that each thing in the world, or at least each thing which is capable of growth or internal change, has a separable spirit of its own. A beautiful instance of this belief is given in that plaintive hymn which the Indian sings to the spirit or kelah of the rice in times of blight. I quote from Mr. Tylor.

'O come, rice kelah, come. Come to the field. Come to the rice. . . . Come from the West. Come from the East. From the throat of the bird, from the maw of the ape, from the throat of the elephant. . . . From all granaries come. O rice kelah, come to the rice.'

TYLOR, *Primitive Culture*, vol. i. p. 475.

When this belief in the existence of spirits in each individual thing was universal, every change was definitely and directly attributed to the action of some will or spirit, either within the thing changed, or external to it. Now man being only directly conscious of the action of his own will over his limbs, and knowing that in every case of such action there intervened between the will and the motion a sensation of effort, naturally assumed an exact similarity in the mode of action of the 'spirits' of other things, which were in fact mere reflected images of his own, and thus blended the notion of conscious effort with those of will and change to form his whole complex notion of cause, that is (as he represented it to himself) of the action of Spirit in the Universe productive of Change.

How entirely personal this notion of Cause originally is, we may gather from several scattered hints. First, the Greek word for Cause (*αἰτία*) is merely a deflection of the adjective which asserts personal responsibility. Secondly, every verb, that is, every statement of change, is primarily personal, in other words, it asserts the interposition of some will which through an effort produces that change. It may be fairly doubted whether the so-called impersonal verbs, even to this day, are really impersonal in the notion which they express—whether the 'it' is not always some vague quasi-personal motive power. I must confess that so far as I can analyse my own thoughts on the subject, there is always some such notion lying latent in my mind when I make use of any of these speciously impersonal verbs.

This notion of Causation depending upon the universal primitive belief of the existence of Spirit in all things was naturally and logically in the light of that belief extended to all change in the universe. But the notion did not die with the gradual destruction of its parent belief. Neither is this to be wondered at. There is hardly a word of anything like wide significance in any modern language, which does not carry about with it vague ghosts of beliefs which once clothed it with vivid life, but which are now long since dead. Are not almost all the terms of Moral Science meaningless without the assumption of the doctrine, long ago dis-

carded, of a local position and corporeal constitution of the Soul?

> " Yes *deep within and deeper yet*
> The *rankling shafts* of conscience hide.
> Quick let the swelling eye forget
> The tears *that in the heart* abide."

Metaphor, say you. Doubtless; but metaphor is meaningless unless we see or can imagine some likeness between the things compared, and almost all the finer metaphors refer our present consciousness of sensations or emotions to former explanations of these, or beliefs about them. We still call the sun Phœbus's car, and the moon pale Cynthia, but neither of these expressions has absolutely any meaning, except in reference to half-forgotten polytheistic legends. Why should our hearts be stirred when the poet, exclaims—

> ' Call it not vain ; they do not err
> Who say that when a Poet dies,
> Mute Nature mourns her worshipper,
> And celebrates his obsequies.' ?

Can any one doubt that the feeling of delight aroused by such lines as these depends upon the revival of the half-dead beliefs which still cling around the words? And we can now see why every poetical metaphor which attempts to give life to a modern creation or invention, always seems to us strained and forced. Fancy still clings to the places once inhabited by belief, but refuses to stir a jot beyond those limits. In

the days when mankind believed that all things which had motion were also endowed with conscious life, steam engines were not. The poet who attributes life to a steam-engine is therefore guilty of an anachronism of imagination, and our fancy refuses to follow him.

Our whole notion of Causation is now one vast metaphor; that is, a vague clinging of the imagination to that which Reason has long ago discarded. Hume, looking at the notion solely from the side of Reason, found in it absolutely no content. Unfortunately, on his principle of deriving all our ideas solely from the sensational experience of the individual man, he was thereupon forced to declare, that since a reasonable man in civilized life could find no direct experience on which he could build an idea answering to the word Cause, there was therefore absolutely no meaning attached to that word. He was thus obliged to run counter to the common consciousness of mankind, which declares to each of us that we have still some notion when we pronounce the word; although Reason declares that that notion when analysed will be found utterly inapplicable to the facts before us, and thus forces the notion to hide itself in the background, and to clothe itself round with misty vagueness.

To us who hold that it is possible for beliefs and tendencies to belief to survive in persons whose whole individual experience is in opposition to those beliefs,

Hume's apparent dilemma presents no difficulty whatsoever, and we may feel confident, in our respect for the greatest thinker that ever arose in England, that had he before him the evidence of two kinds which we now have (that, to wit, as to Primitive Animism and that as to the inheritance of beliefs), he could not so slightly have dismissed in a note the hypothesis which contains the germ of the true theory.

We have now discussed at length (α) the real nature of the causal connection between phænomena, (β), the notion which mankind form of that connection. We have seen that this notion, although once by aid of the doctrine of Animism it covered sufficiently the whole field of change, is now properly applicable to but a small portion of those changes to which the name of Causation is ordinarily applied, and that the consciousness of this fact has given to the notion of Cause a vagueness which is continually increasing.

In the next two chapters we shall discuss the methods by which mankind discovers (or manufactures) and makes use of the causal connections between phænomena.

CHAPTER V.

ON INDUCTION.

AN induction is usually defined as the progress from a number of detailed facts to the universal law which is common to all those facts, and forms the explanation of them, or more vaguely as a progress from the less general to the more general, from the particular to the universal. That this method of observing and collecting single instances, and by the comparison of them evolving a general law, is the most important, though by no means the only, function of science, is sufficiently obvious. It behoves us, then, to give a rational account of this process in accordance with our theory that a cause is a mere sign. If we fail to do so satisfactorily we may as well throw that theory to the winds at once. Our task then in this chapter is to enquire what is the exact portion which Induction aims at performing of the great work of fitting man for his circumstances, and how far it succeeds in this aim.

With the savage, whose circumstances are comparatively simple, it is doubtful whether, as a rule, any

inductive processes are necessary. The first time he finds a change in one thing, followed by a change in another, he is at once ready to assume that next time he sees the first change the second will follow, or, as he expresses it, in his animistic phraseology, that the first thing is the *cause* of the change in the second. (Not the *change* in the first thing, be it noted, for as we have seen, his notion of cause is strictly personal, and the thing is for him a person.) He will assume this connection immediately after one instance, and will not have the slightest desire to count up cases, though, no doubt, a repetition of those cases will strengthen his expectation according to the principles which we have clearly laid down. So, too, with a child, though in his case the simplicity is perhaps marred by inherited tendencies of doubt. 'A burnt child dreads the fire,' and dreads equally all fires. He will not only carefully avoid the kitchen grate against which he has fallen, but as long as his memory is fresh you will not succeed in inducing him to play at snap-dragon.

But the experience both of the child and of the savage race will widen. Both will be exposed to more variable circumstances, and will meet with frequent cases where the original sign has not been followed by the effect; and, again, where the effect has been preceded not by that sign, but by some other. The child will, step by step, be transferred from the comparative

uniformity of the nursery to the more varied life of school and the wilder vortex of the world. The savage, from the life of the hunter, where a foot-mark on the snow or the sand always denoted the proximity of a definite animal, will, as population advances, be compelled to betake himself to the life of the shepherd or the agriculturist; he will be forced to watch the varying and uncertain signs of the skies, the doubtful indications of disease among his flock, and the varieties in the character of the soil, with their capricious results.

For this increased complexity of experience new processes will be necessary. If he has noticed that some one phænomenon is preceded in all cases of his experience by some one of two or three phænomena, he will probably be content to treat all these two or three antecedent phænomena indifferently as the signs or 'Causes' of the subsequent phænomena, though, as we have seen, he will thus be rendered unable to perform one of the two functions which the discovery of Causal links renders possible, that is, the arguing backward from the observed presence of the effect to the simultaneous or immediately precedent existence of the Cause, an operation which can only be performed with certainty when there is but one cause for one effect.

If, however, as his experience increases, the number of phænomena which he has noticed as antecedents of any one phænomenon or 'effect,' become consider-

able, no one of these phænomena being repeated in all cases, he will be reduced to a difficulty. If he pursued his former plan, and treated each of these phænomena indifferently as signs of the effect, he would run a double danger. In the first place in attempting to reason from the presence of the cause to that of the effect, he might, if the causes were numerous, forget one of them altogether, and omit to expect the effect. In the second place, when he observed the effect, he would necessarily perform slowly and with considerable risk of failure the task of running over in his mind all the observed antecedents, the presence of one of which either at the moment or immediately before, the sensation of the effect should lead him to infer. The one he omitted might be the exact one which was actually present on the occasion in question, and his omission to consider it on that occasion might give rise to an erroneous course of action.

Supposing, on different occasions, when his dog had shaken its head violently, he had discovered that it had either a drop of water in the interior of the ear, or a flea on the outer skin, or canker, or some hair turned inwards into the orifice; and some other time, when his dog shook his head, was to think of only three of these possible antecedents, omitting, for instance, the third, his treatment of his dog would not be that best suited to keep him in perfect order. Moreover the fact of having

to run over a number of possible antecedents must necessarily produce a slowness and uncertainty of action, both of which are always harmful, and may in certain cases be dangerous. Still more will this be the case if his knowledge of the possible antecedents be not due to his own observation but, at least in part, depend upon information received from others. If a man shall tell me that after a warm rain, or where sheep have been kept, or where there are rings in the grass, mushrooms are wont to grow, I having no experience of mushrooms other than that of seeing them after they are picked, I am very likely to forget a portion of my information and so, perhaps, miss my mushrooms.

In all cases, therefore, in which the number of antecedent signs exceeded one or two, man found a need of some short-hand method by which he might connect in his own memory, and convey to his fellows, a knowledge of all the observed antecedent signs of any phænomenon, without going through the risky and laborious process of enumerating these signs. This need, and the process which supplied it, are respectively the parent and the primitive form of Scientific Induction.

The problem before him was this. Given a single phænomenon which, on different occasions on which I have observed it, has been preceded by some one of a number of other phænomena, each one of these occurring on some one occasion at least without any of the others;

in what form am I to cast the whole of this complex and varying experience in order that it may be most useful to myself and to those to whom I communicate it, and most easy to remember in its full extent?

The first answer which might be given to this question is not far to seek. If the observed antecedent phænomena were complex and contained a simple element which were common to all of them and to no other observed phænomena, this simpler element might be taken as the connecting link between them, and in order to convey knowledge to my friend I should not give him a list of the phænomena which were followed by the effect, but merely mention the one mark or portion which each of these in common possessed. This mark would then in future constitute, both for him and for me, the sign or cause of the subsequent phænomenon. The appearance of a ghost is, according to different stories, preceded by a variety of facts, but a constant element in these antecedent facts is the unhappiness or disquiet of some dead person; this, then, may be taken as the connecting link between all the stories, or the cause of the ghostly apparition.

To put it symbolically, we have observed in past time A, B, C, D, etc., all followed by F, where A, B, C, D, etc., are too numerous to be conveniently enumerated or retained in the memory. Now if A, B, C, D, etc., be complex phænomena which have a common element,

E, which does not belong to any other observed phænomena than those followed by F, we obviously throw our knowledge of those sequences of which F is the last term, into simple form by saying E is always followed by F, or E is the cause of F.

But the number of cases in which we can resort to such a simple course as this is extremely small. We shall very rarely find that our observed complex antecedent phænomena have such a simple element which is common to them and them only; and moreover, in many cases, the antecedent phænomena will be (at least as far as our observation goes) absolutely simple, so that it will be hopeless to look for a connecting element. In these cases—and they are practically the only ones with which Science deals—a more elaborate and not by any means equally satisfactory method has to be followed. That method proceeds on this wise.

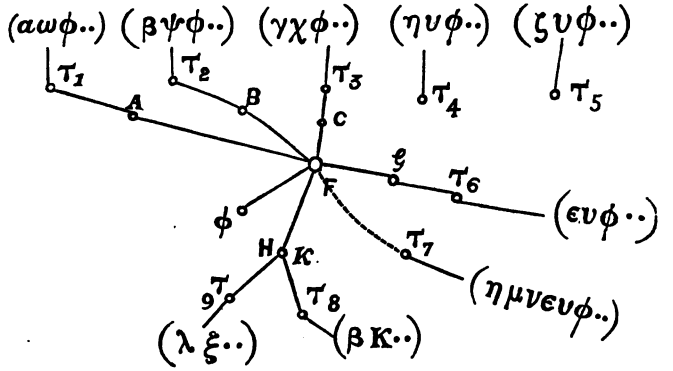
Each one of the antecedent observed phænomena which we wish to connect must necessarily be an attribute or change of some thing. Now although the phænomena themselves have nought in common which will serve for a connecting link, yet the things to which they are referred must necessarily not only have an attribute in common, but also some attribute which belongs to nought else yet observed, except those things which are also possessed of some other attribute, or capable of some change, which has in past experience been fol-

lowed by the effect, whose causal law we seek to establish. I say *necessarily* because the number of attributes which every single thing has is potentially infinite according to the varieties of circumstances to which we expose that thing. Our experience then being merely finite, we may by continual variations of circumstances, and rejections of those attributes which are either not common to all the things which we wish to connect, or which extend beyond them, eventually arrive at one which exactly suits our purpose—which belongs to all the observed things which have any one of the phænomena that have been observed to precede the effect and to no other known things whatsoever. Here, as before, though with even less propriety, we shall call the newly discovered common link the Cause of that phænomenon, whose real or proximate causes are changes or attributes of those things who have that attribute which we use as a link in common.

The diagram on the next page will throw light on the process.

Here F is the phænomenon whose cause we wish to discover; A, B, C, are its observed immediate antecedents, which seem more closely connected with it than any other antecedents whatsoever, but each one of which has been observed as an antecedent in cases where neither of the other two have appeared. τ_1, τ_2, etc., are the things to which the phænomena A, B, C, etc.,

are referred or belong; $(\alpha\omega\phi\text{-})$, $(\beta\psi\phi\text{-})$, $(\gamma\chi\phi\text{-})$, etc., are other observed or discoverable attributes of τ_1, τ_2, etc. Now ϕ is common to τ_1, τ_2, and τ_3; so long then as



A, B, C, or some one of them are always observed as antecedents of F, we shall use ϕ as a connecting link between them, and say that ϕ is the cause of F.

Now in any intelligible sense of the word 'Cause,' ϕ is not the cause of F. Up to the point which our experience has at present reached, it has never been even a real antecedent, far less an unconditional antecedent of F. It is merely a phænomenon which under certain peculiar circumstances may be made subsequent to each one of the things to some change of each of which F is itself subsequent. To say then that ϕ is the cause of F is merely a very concise form of stating that all those things which have one attribute ϕ have also another attribute (not the same in each) which is the real cause or immediate antecedent of F.

Experiment in almost all cases consists in putting a number of observed things which have a common indirect effect into a number of unusual circumstances, in order to discover an attribute which is common to these things, and to these only, and which may therefore be used as the connecting link between them.

Now the use of such a cause or sign as this is open to several objections. In the first place it is of little or no service to the unlearned. It does not usually enable them to distinguish those things which according to past experience may be expected to be followed by the Effect from any other things whatsoever. It is usually some recondite attribute whose existence can only be demonstrated in laboratories, and whose very nature is frequently inconceivable to the majority, *e.g.* the arrangement of crystals as a cause of any of the obvious properties of things. In the second place, even to the scientific men, the newly discovered phænomenon has never been presented in order of sensation as the antecedent of that whose cause it is said to be, and therefore the act of thinking from the one to the other will always be an artificial one and must be performed rather by means of ideas of the words than by those of the phænomena, since the connection between the phænomena themselves is only an indirect one, with a considerable number of intermediate steps, which would tax and impede thought.

Now, although the verbal connection is important for holding the two phænomena together in the mind, it has, as it were, to be retranslated into ideas of that which the words signify, before it can be of any value for the purposes of life, and here the retranslation will involve the mental enumeration of the list of things whose attribute the artificial link or cause is; an enumeration in which there is, of course, all the old danger of error. So that the newly-established connection rather conceals than gets rid of the difficulty arising from the increasing variety of experience. The so-called discovery of cause is in such cases the finding out, not of causes at all, but of links wherewith to bind together causes.

There are certain cases, however, where we may, perhaps, get a direct connection between ϕ and F, and thus a real natural expectation of a certain degree that F will follow ϕ. In such a case we have really A, B, C, and ϕ in the various cases as direct antecedents or causes of F, and we have also ϕ as a subsequent possible sensation to the things to which A, B, C, belong, so that ϕ is partly a real cause and partly a mere artificial one of the whole number of appearances of F.

In such cases the mind, in its natural desire for a strong expectation and quick action, strives, and, imagination aiding it, to a great extent succeeds in

extending its notion of ϕ as real cause or antecedent of F to those cases in which it is merely an artificial connecting link, and it is ready to extend this notion to any new things whereof ϕ be discovered as a subsequent phænomenon, that is to expect that these things, or some change of them, will be followed by F.

Yet in many cases it must needs discover that other before-unexamined things τ_4 and τ_5, both of which have the attribute or potential subsequent phænomenon ϕ, can by no known process be made the antecedents, either direct or indirect, of F. Still, if ϕ has been discovered capable of binding together a great number of things, τ_1, τ_2, etc., upon some change of each one of which F follows, we shall be very much disinclined to abandon the formula, "ϕ is the cause of F," and to begin afresh a search for some new attribute which will be exactly sufficient to bind together all known things which are indirectly followed by F, *and those only*. If we have only one case (τ_4) in which a thing which has the atribute ϕ is not followed by F, we shall content ourselves by saying that among the attributes of τ_4 there must be some counteracting cause to ϕ, that is, something which we might, if we knew it, use as a sign that a given result was not about to occur in cases otherwise similar to those in which we have known it occur.

As far as our present experience goes, we might take any one of the attributes of τ_4 which is not possessed by

τ_1, τ_2, etc., for this sign or counteracting cause. But from the fact that our choice is perfectly indifferent between a number of attributes, and that both cause and counteracting cause are purely artificial, and invented for convenient classification, we are apt, for the time, to reserve our judgment until we see whether there be not other things τ_3, etc., which have the attribute ϕ, but are not followed by F, in order that, if such other things exist, we may look out for some common attribute between them and τ_4 by means of which we may tie together all the things from whose presence, although they have the attribute ϕ, we shall not expect nor be able to induce the appearance of phænomenon F. If υ be such a common attribute between τ_4, τ_5, etc., we shall call υ the counteracting cause of ϕ in the same artificial sense in which ϕ is the cause of F.

From what we have said above as to the potential infinity of the attributes of any one thing, it will follow that we shall always be able to discover some such attribute υ which shall be exactly sufficient to tie together all those things which, according to our present experience, have the attribute ϕ but are not followed by F. If, again, we found a phænomenon G which was followed by F, and which was referable to something τ_6 which had the qualities ϵ υ ϕ, etc., we might say that either ϵ, or some other

attribute of τ_6, was a counteracting cause of v, and thus left ϕ free to work. But when freed from all animistic associations, this statement, like the rest, would be merely equivalent to an expression of our intention to take ϵ or some other more suitable attribute for tying together those cases in our experience where things having both the attributes v and ϕ were indirectly followed by F.

In no case have we any logical right to extend our assertion beyond our experience, though in all cases we must necessarily extend our expectation beyond those limits, and must therefore be frequently disappointed. We have no right to say *à priori* whether any newly-observed thing (τ_7), which has the attributes $\eta\mu\nu\epsilon v\phi$ . . . will or will not be capable of being the indirect cause of F.

We know, however, generally, that, so long as Man is to exist on the planet, by far the greater number of his expectations must be in accordance with facts. Were it not so, he would necessarily disappear, and his place be taken by something which was more frequently right in its expectation of proximate events, and therefore in its adjustment of itself to them. We are, therefore, philosophically justified in assuming provisionally—what we must needs expect—that the varying attributes of the newly-observed thing are unimportant as far as its connection with F is concerned,

that they are neither causes nor counteracting causes. The assumption amounts precisely to this, that τ_7 will be followed by the same phænomena as τ_6, which it resembles in many points.

If we are disappointed in our expectation in this special case it will of course be open to us to repeat our process and choose a new counteracting cause of ϵ, but after a few such steps we shall get such a confusion of causes, counteracting and cross-counteracting each other, that our classification will be valueless, and we shall therefore reluctantly discard ϕ as a link between all the things which are followed by F, and beginning anew with our wider experience, look out for some attribute which is common to τ_6, τ_3, τ_2, τ_1, etc., all those things which are capable of being followed by F, but not to τ_4, τ_5, τ_7, etc., which, although possessed of a number of similar attributes, are never followed by F. That such a link may be found, we must always firmly believe, but the difficulty of finding it will be always, roughly speaking, proportionate to the number of cases to be considered. As long, then, as we know that the phænomena A, B, C, G, etc., are all followed by F, but have no link by which we may tie together the former detached phænomena, we say that the connection between each of these phænomena and F is merely *casual*, that is, that we are still seeking for some such connecting link. Thus, in a very valuable sense, is that maxim

of the old Philosophy true which asserts that Chance is but Undiscovered Cause, or, as we may paraphrase it, a sequence of two phænomena which we are at present unable to connect with several other observed sequences which have the same second term or Effect.

Of course all I have said as to the continually existing possibility of our finding things which have the attribute ϕ, without being followed by F, is equally applicable to the chance of our finding sequences of phænomena which have F for the last term, but whereof none of the antecedent phænomena can be referred to anything which has the attribute ϕ. F may be preceded by phænomena H, K, etc.; now these phænomena may be changes in things τ_8, τ_9, which neither of them possess the attribute ϕ. The remedy here, as before, is either to admit two or more causes for one phænomenon, which is inconvenient, or to discard ϕ, and seek a new and more catholic connecting link.

An important point which so far as I know has not been noticed by any writer on the subject, is this. As our bundles of antecedent phænomena become more and more extended, the connecting link between them becomes ever more and more constantly some attribute which has not at first been observed to belong to any one of them. The reason of this is not hard to discern. That of which we take first count at the dawn of thought, is the difference between two things. As our

reason develops, we observe next those qualities of some few things wherein they resemble, differing from all the rest. Very late indeed do we proceed to take notice of those wide-extended attributes which belong to a vast multitude of things that have nothing else in common. Yet it is precisely these last attributes which are most useful in linking together extended groups of causal sequences, or, as the current phrase goes, establishing universal Laws of Nature. When, therefore, we have long been accustomed to discover that the most important connecting links or causes (in the artificial sense) are usually only hit upon late in the course of an investigation, and that even after their discovery they are not often obvious at first sight to the casual observer, as he simply looks upon any one of the things whose common attribute they are, we soon get into the way of imagining that because the most widely applicable links are recondite, a recondite link is preferable, and more likely to cover new cases than an obvious one, where both are equally applicable to the cases already known.

It is hardly needful to say that such a belief is altogether without logical warrant. Yet can we now never rest contented with an obvious link, but always feel dissatisfied till we have found a recondite one. Thus, for instance, if we found that all brown cows had certain peculiarities in the quality of their milk, we should consider it childish to say that the brown colour was

the cause of the peculiarity, though this explanation would most naturally suggest itself to the uncorrupted intelligence of the savage. We should say that both the brown colour, and the quality of the milk were caused by some hidden inner attribute of the cow. When we had at last discovered some such hidden inner quality, that is some attribute common to all brown cows and to these only, we should plume ourselves greatly on our advance in science and discovery of true cause in the place of mere empirical connection.

Of course, if we could ever make this hidden inner attribute a real antecedent to the production of brown colour, or again to peculiarities in the quality of the milk, we should be quite right in taking it as the cause of either phænomenon. So again, if the inner attribute was possessed by other cows, or any animals of another species, which had all of them the peculiarity of milk, but not all of them the brown colour, this attribute, although it might in no case be a real antecedent of the peculiarity of the milk, would be a convenient artificial cause. But in many cases we are neither able to make the inner and later discovered attribute a true antecedent, nor to extend it to cases which will not be covered by some such obvious external attribute as that of brown colour, and we call the inner and less obvious attribute the cause, *merely because it is inner* and later discovered—a reason which appears sufficiently childish

at first sight. Yet is our preference neither altogether irrational, nor at all meaningless. It is a result and indication of the history and progress of man, a progress in which he has passed from the use of simple and obvious signs, to the employment of those deep-hidden and hardly-attained attributes which are yet in the majority of cases most convenient as artificial links by which he may connect a number of otherwise detached sequences of phænomena.

This continual searching for some inner and hidden attribute, as that which will most probably form the best artificial cause to bind together a large number of sequences of phænomena with a common last term or effect, throws light on that observation of Brown which we have referred to above (p. 148). Children and savages naturally assume a causal link after the experience of a few sequences, because they are contented with some obvious attribute for the first term, sign, or cause. Civilized men, not being contented with such an obvious sign, search still for some hidden attribute which they hope may be extended to connect a larger number of sequences than can be held together by the simple and easily observed true antecedent which the unlearned at once seize upon. The civilized man, therefore, proceeds more slowly and cautiously in his discovery or choice of causes, precisely in proportion to his civilization, which by suggesting to him the advantage

of wide-extending laws or connections of causal sequences, has forced upon him the use of those hidden attributes by which alone such wide connections can usually be accomplished.

Let us go back for a moment over the ground we have traversed in these two last chapters, in order that we may be better prepared to solve the crucial question, Does our view of Causation and of Induction diminish or altogether deny the value of Scientific Induction?

We have pointed out that a cause in its original and most strict sense is an antecedent phænomenon which is used as a sign; not necessarily an invariable antecedent nor in any sense an unconditional antecedent, but at least a very frequent precursor, and probably one which in all cases within the experience of him, who first uses it as a sign or cause, has been followed by the effect; that a cause in its second and more artificial, but probably at present more frequent, signification is an attribute which is not, strictly speaking, the antecedent of the effect, but which belongs to a number of heterogeneous things, each of which things has in past time more or less frequently manifested some phænomenon (not the same in each) which has been directly followed by the effect; that Induction in the Scientific sense is devoted to the discovery of these connecting attributes; that finally this Scientific Induction has a somewhat unreasonable but perfectly natural and

accountable preference for internal and recondite attributes rather than for external and obvious ones, and is loath to allow to the latter the name of Causes.

It seems, then, that Induction at all events is limited to the task which Hobbes and the pure Nominalists consider the sole function of Science—that of tying things up into bundles. At first sight the occupation does not seem a very honourable or worthy one. But when we consider it in relation to that process which we affirm to be the main end and aim of all science and all enquiry—the adjustment of man to his circumstances—we shall easily see that this bundle-tying forms no small nor insignificant portion of that vast and ever-changing labour.

The use of such bundle-tying is two-fold; first, in aiding the memory of the individual investigator; secondly, in enabling him to convey the result of his researches to others in a more convenient form. Both of these two benefits greatly facilitate that quickness and certainty of action which renders Man not the passive victim but, in some sense, the moderator and king of the turbulent multitude of phænomena which press ever upon him. The second benefit is, however, by far the more important of the two, and with this we are chiefly concerned. A full description and analysis of the process of an individual investigator, and the method of his communication of his discovery to his fellow-men, will

enable us to see more definitely both what Induction can and does perform for us, and what are those functions which she vainly claims to fulfil. We shall then understand how enormous is the power of the Inductive Method in increasing the fitness of man for his circumstances, and shall perceive at the same time how utterly impotent that method is when it aims at achieving absolute certainty, or indeed at arriving at any new truth in the strict sense of that term.

Suppose that any man perceived that (α) the addition of fresh fuel; (β) the action of the bellows; (γ) a frosty day, all increased the flame of the fire, he might at first be contented with observing that each of these phænomena was a cause of the increase of flame, and whensoever he might wish to produce a cheerier blaze might make use of any one of these three phænomena according to the facility of procuring them. In the same way whensoever he noticed the occurrence of any of the three he might expect the result to be repeated. But if, instead of merely three observed antecedent phænomena, he discovered, as his experience extended, a very large number of such changes, each of which was indifferently the antecedent of an increase of flame, he would soon find it hard to remember all the possible direct antecedents or real causes, and might absolutely omit to take into account on any given occasion the only one which at the moment it was in his power to reproduce.

If, however, he were able to discover that in each case of the increase of blaze somewhat had been added to the fire which, on analysis, was found to contain oxygen, he would sum up the result of his varied experience by saying that all things containing oxygen and added to a fire produced a blaze. (I assume that he had had no contradictory experience.) He would probably go further than this, and say that oxygen was the cause of the increase of blaze. But this would be a mere short-hand way of expressing his former proposition, and it would by no means necessarily follow that he had been able yet to make oxygen a real cause, that is, a noticed antecedent. The second proposition does indeed express something more than the first, but the additional meaning, when duly analysed, asserts nought whatsoever about the observed phænomena or their relation, but merely an intention of the speaker. When I say 'all things containing oxygen when added to a fire produce an increase of flame,' I merely sum up my past experience, and am conscious that if, after more extended experience, I find a thing containing oxygen which does not increase flame, I shall have to discard or qualify my assertion. When, on the other hand, I affirm that oxygen is the cause of the increase of flame, I add to my former assertion the declaration, or at least suggestion, that in case I find a contradictory instance, I shall not discard or modify my formula, but

shall seek for a "counteracting cause" by means of which to classify the present contradictory instance with others which may be hereafter observed.

It is obvious that in this case the general induction 'Oxygen is the cause of the increase of flame' contains no new truth in addition to the special observed sequences. The known facts are identically the same as they were before the promulgation of the formula which binds them together, and the formula will express to each individual exactly the number of varying sequences with increase of flame for last term, which he already knows; neither more nor less.

It is true that by most individuals it will be taken as expressing somewhat more than this—they will understand it somewhat after this fashion, 'All the cases which I have noticed where flame has been increased have had among their antecedents the addition to the fire of a substance which I know or believe has been found on analysis to contain oxygen or to promote the consumption thereof, and I further believe that there are a great number of other cases unlike those which I have noticed, which have been investigated by scientific men, where also oxygen has always been discovered on analysis of the substance added to the fire; I hold still further that I am not likely to meet with any case which is unlike those which have been investigated by others, since my circumstances are far

less varied than those of my informants, taken as a whole.'

But all this addition does not in any way spring from the special induction; it is the general formula of ignorance willing to believe. Moreover it asserts no positive belief of any kind as to the matter in hand, but merely the intention of believing when the occasion arises. At present it is absolutely without content, it has merely a potential value and in this potential state induction must leave it. How this potential and vague tendency may be converted into a positive belief of a definite value we shall inquire in the next chapter. For the present we may be content to notice that, if in any way a new substance be presented to me in which I have reason to believe oxygen is contained or from which it may be generated, I shall at once assume that this substance is one of those which have already been investigated by scientific men, and that its addition to the fire will increase the flame. I am thus able to appropriate to myself the whole of the experience of others. It is true, that even supposing that I have hit upon no hitherto unnoticed substance, yet that its addition to the fire may not in any given case produce an increase of flame since the whole of the immediately antecedent circumstances will never be quite the same as in any preceding case, and there is no absolute fixity in nature. But this danger is common

to all science and its nature and limits we have already discussed.

We may now clearly and boldly state that the chief function of Induction is the furnishing of formulæ for communication to others not exactly of beliefs, but of tendencies to believe when the occasion presents itself; that this function is an eminently important one, but that neither it nor any other function of Induction is concerned with the acquisition of absolutely certain knowledge.

CHAPTER VI.

OF SYLLOGISM AND DEDUCTIVE REASONING.

In the preceding chapters we have discussed the nature of universal propositions—those I mean which are thought to be true, not of any individual or number of individual things, nor again at any given time or times; but, throughout the whole range of human experience and expectation, of whatsoever individuals have borne, do bear, or shall be found to bear certain marks. We have seen that all such universal propositions, as indeed all propositions whatsoever, may be divided into two great classes—those which assert the possession of an attribute by a thing, and those which affirm a causal connection between two phænomena. We may further have noticed that each of these two large classes of propositions may be subdivided by a parallel which will cross both. We have simple and natural attributive propositions which assert the possession of such or such a quality by some real natural kind, and simple and natural causal propositions where there is a real and

observable constant succession between two phænomena. So again we have artificial attributive propositions, which assert some property of an artificial kind, made up of several natural kinds, and artificial causal propositions where the 'cause' is not the real antecedent, but merely a convenient connecting link between several such real antecedents. The distinction between natural and artificial propositions of the two great classes is all-important for the due understanding and solution of the vexed question of the functions and value of the syllogism.

For see now; suppose I say all apples have pips; this thing which I hold in my hand is an apple, therefore it has pips. It is obvious that anyone to whom the first of my premisses had any meaning would at once know, without any need of my second proposition, that the thing which I held in my hand had pips. He would be aware that in making the first assertion I necessarily included the apple which I held in my hand, and my third proposition or conclusion would express to him no new thought, but merely a part of the complex general thought expressed by that first proposition.

But let me say, All mammals have lungs; the whale is a mammal; therefore the whale has lungs. Now was it necessary that the man who made and attached a definite sense to my first proposition, should know immediately on affirming it, that the whale had lungs?

I assert that it was not. All that his first proposition meant was this; that, in his own experience and reading, no animal had been met with which gave suck to its young, but which was without lungs, and that in his belief the wider experience of others had also met with no contradictory instance, that he was therefore ready to believe that any new case which was presented to him would not be new in the general experience of investigators, and would therefore conform to this rule. When he stated or heard the proposition, he would run over rapidly in his mind a number of mammals in which the whale might not be included, either because he was utterly unaware at the time that the whale was a mammal, or because he did not remember it at the moment. The conjunction then of the two propositions 'all mammals have lungs,' and 'the whale is a mammal,' will induce him to pass from the thought whale to the thought of the possession of lungs.

Now this transition or connection of thought may never have occurred to him, even if he knew that the whale was a mammal, and can never have occurred to him if he did not before know it. In either of these two cases then, the syllogism or deductive proof will have given him a connection between two ideas which he did not before possess, and, as knowledge is agreed to consist in connections between ideas, will have added a new item to the sum of his knowledge. The thought,

the whale has lungs, is not necessarily included amongst the thoughts suggested by the artificial proposition, all mammals have lungs.

The same distinction holds for simple and artificial causal propositions. The simple causal proposition is an assertion of real visible connection between phænomena, and he who asserts it must in the very assertion think it to be true of all similar phænomena whatsoever. If I say, all magnets attract iron; this is a magnet, therefore this attracts iron, my conclusion is obviously a mere portion of my first proposition (putting aside any difficulties there may be in discovering what is and what is not a magnet, as, for instance, if we limit ourselves to those red-coated horse-shoes from which we all learnt as children one of our first lessons in experimental science). If, however, I shall say all oxygenous substances increase combustion, or, more shortly, oxygen is a cause of increased combustion, it is almost impossible that at the moment of making the proposition I should run over in my mind, even if I knew them, all the substances which contain oxygen. All I can do is to register an intention of expecting that any substance that I shall discover to contain oxygen will be favourable to combustion; any such proposition as, Substance A or B contains oxygen, will call this intention into execution, and give rise to the conclusion, Substance A or B is favourable to combustion, which, if A and B

were not among the substances which I ran over in my mind when I enunciated the general proposition, will represent a new connection of ideas, and therefore a new piece of knowledge.

We have arrived then at this point. Deductive Reasoning or Syllogism is absolutely meaningless when applied to simple and natural universal propositions, whether of causation or of attribution. With regard to complex universal propositions it may be, and frequently is, useful in giving to the individual enquirer knowledge which he did not before possess. Whether he be said to have before *potentially* possessed it or no, makes nothing to the matter. Potential knowledge is actual ignorance, it has in fact no more reality than that potential existence of the ancients which modern philosophers so scornfully reject. Why these same philosophers should retain the equally mythical potential knowledge passes my comprehension—unless indeed it be that this latter myth serves for the greater glorification of the modern idol Induction, by filching for its adornment the due honours of its old-fashioned rival, Syllogism. As a mode of instruction, or for the conveyance of knowledge to others, Syllogism is all-important, and, in fact, by far the greater part of teaching is conducted by means of it.

But can it do no more than this? Is it capable in any way of enlarging the stock of human knowledge con-

sidered as a whole? This question is an entirely different one from that which we have hitherto discussed, and should be kept entirely separate, which unfortunately it rarely if ever has been in discussions of the subject. Deduction might properly be called a process for acquiring knowledge, even although its functions were limited to communicating to the individual enquirer facts which he had not formerly possessed, but which had already been the property of others; but its value will doubtless be greatly increased if we can show that it frequently enables enquirers to arrive at truths which no human being had before known that is presented to himself in thought.

I think that I shall be able to show that this is the case; but in order that I may do so, I must beg the reader to consider the general notion of Deduction rather than that special form with which we are most familiar.

All thought, we have seen, is the passage from idea to idea. Now this passage may be either immediate, when the two things or phænomena represented by the ideas have been directly connected in experience, or mediate, when each of them is connected in thought (and prior experience) with some third idea which forms the link between them. The connection of each of them with this third idea may again be either mediate or immediate, and the number of steps which must

needs be taken in passing from the first to the last may be increased to any extent. I may know, for instance, that all the artificial class A have the attribute B, that all things which have B have C, that all things which have C have D, and that all things which have D have E. Now here it is obvious when I put together all these propositions that the result follows, that all things which are included in A have the attribute E, but was it in the least necessary that I should have known this when I propounded each of the separate propositions? I answer, certainly not. When I stated my first proposition I no doubt thought of the natural kinds which were contained in A (α, β, γ, etc.). Now if I represent humanity at large, my α, β, γ will represent truly the whole artificial class A so that I really do think that each one of these separately has B, but when, at some other time, I state that all things which have B have also C, I really think of the connection of the attributes rather than of the individuals or classes to which these attributes apply. A large number of other classes besides A may have the attribute B, and my experience (being *ex hypothesi* universal) will cover them all.

In enunciating my general proposition I may think of the artificial classes which have the attribute B (or, more strictly speaking, of their names, since of an artificial class there is usually no true idea), but it would be impossible to break up all of these artificial

classes into the natural kinds which are contained under them, and there is no reason why I should break up the class A more than any other of the many such classes which possess B. The formulation of the truth, 'All things which possess B possess also C,' is a mere statement of a universal observation of the connection of attributes, which does not imply or even suggest any further observation of the things which possess those attributes. When, again, I enunciate the proposition all things which have C have D, I merely assert (representing again the human race) my universal experience of the conjunction of these two attributes. I may or may not have noticed at the time that amongst the things which had C were all the things which had B, but this notice will not be immediately or necessarily suggested by the proposition before me; still less will any knowledge as to what might be the artificial classes which possessed B.

For every step which has to be traversed A vanishes more absolutely from view, and, when the intermediate steps are many, it may well be that mankind shall for years, nay centuries, have been possessed of the separate propositions which constitute them, yet have never discovered the possibility of so placing them together as to show or discover the connection between the first term and the last. Whoever, then, makes the discovery that A is E, by following the process I have described,

adds, I affirm, an item to the knowledge of the human race. When the connection is once demonstrated, by means of the use of the names which are thus put into juxtaposition, man is enabled to pass at once from the former idea to the latter without repeating on each occasion the process by which the connection was arrived at. He has got a piece of knowledge in practical working order which he may use immediately when the occasion presents itself. He is more perfectly adjusted to his circumstances than he was before the discovery.

Nay, but at any moment before, man might, had he so chosen, have made this discovery. At any moment I may cut my throat with my pocket-knife, but I have not yet done so, nor has mankind yet got the knowledge that A is E till some one has put together the detached propositions and demonstrated the fact. To say that mankind already *knows* a fact simply because the material is at hand from which that knowledge may be procured with proper skill and diligence, is to assert that a member of a firm, whose books have not been posted for years, is aware of the state of the concern simply because all the required knowledge may be abstracted from the books; the task of abstracting such knowledge may obviously require an amount of skill and perseverance with which but few individuals are endowed.

The result of our enquiry is this: Syllogism or Deduction with three terms is frequently useful for the increas-

ing the knowledge of the individual, but rarely, if ever, serves to add to the stock of the Human Race. Deduction, however, in the wider sense of the placing of a number of intermediate terms as stages, by means of which the mind may pass from one idea to another otherwise unconnected with it, hath often and will often establish connections between ideas which no mind has hitherto noticed; by means of the conjunction of the names hath rendered those connections practically direct; and hath thus given new thought or new Knowledge to man. It is, perhaps, hardly necessary to point out that as every one of these complex deductions, depends upon a number of separate observations or inductions, and as no one of the inductions can, according to our system, rise to the ideal level of absolute certainty, it follows by the laws of probability (which may be assumed as roughly, if not accurately correct) that our expectation of the connection between two things which is deduced from a number of observed connections should be much weaker than our confidence in any one of these observed connections; so that if the number of steps be large, the expectation should be proportionally small; and on this ground we may support the law, which has long ago been laid down by philosophers, that a complex deduction should be always, if it may be, supported by a direct observation. Absolute truth lies further from Deductive Science than even from

Inductive. The so-called Deductive Sciences, which seem most nearly to approximate to such truth rest, as has been pointed out by Mr. Mill and others, on very wide and very simple Inductions. Hence the stronger expectation they arouse. Every Deduction requires two or more prior Inductions, but the Deduction is not a mere process of repeating the statement arrived at by the Induction, nor does its result at all necessarily resemble any of the inductive truths on which it is founded. It is an original and distinct process of arriving at knowledge.

Against this view arise in arms, the great majority of modern logicians, headed by their champion, Mr. Mill, in his chapter on the Functions and Value of the Syllogism (Logic, Part II., chap. iii.), though as Dr. Mansel long ago pointed out his criticism contained in that chapter seems inconsistent with what he afterwards says of the importance of the Inductive Methods.* Limiting his view of Deduction to that small and least important portion of it, which is represented by the Syllogism, he affirms that it is absolutely incapable of arriving at new truth (presumably even for the individual, for nothing is said as to the distinction between truth for the individual and that for mankind at large). He would limit the function of the syllogism to that of

* Cf. Appendix on the Syllogism in Mansel's edition of Aldrich's 'Artis Logicæ Rudimenta.'

a registering machine for the convenient storing of knowledge already possessed and the production of it when required for a special case. The whole chapter should be carefully read by whosoever wishes to understand the rights of the controversy, since the doctrine, which I believe to be erroneous, is there stated in the clearest and most forcible form. I will content myself in this place with quoting and commenting on those passages which seem most immediately to bear on the question.

The most explicit passages in the chapter are contained in sections 2 and 3, and in the note at the end of the former section. There is always a danger in abridgments or fragmentary quotations of an argument. It may ever be thought or said, that the view thus presented is not a fair account of the position of the author criticized; I prefer, therefore, even at the risk of wearying my reader, to quote the passages in full before proceeding to discuss the theory contained in them. Section 2 runs thus:—

'It must be granted that in every syllogism considered as an argument to prove the conclusion, there is a *petitio principii*' [*i.e.*, an assumption of that which it behoves us to prove]. 'When we say—

All men are mortal,
Socrates is a man,
therefore
Socrates is mortal.

it is unanswerably urged by the adversaries of the syllogistic theory, that the proposition, Socrates is mortal, is presupposed in the more general assumption, All men are mortal; that we cannot be assured of the mortality of all men, unless we are already certain of the mortality of every individual man; that if it be still doubtful whether Socrates, or any other individual whom you choose to name, be mortal or not, the same degree of uncertainty must hang over the assertion, All men are mortal; that the general principle, instead of being given as evidence of the particular case, cannot itself be taken for true without exception, until every shadow of doubt which could affect any case comprised within it is dispelled by evidence *aliundè;* and then what remains for the syllogism to prove? That, in short, no reasoning from generals to particulars can, as such, prove anything; since from a general principle we cannot infer any particulars other than those which the principle itself assumes as known.

'This doctrine appears to be irrefragable; and if logicians, though unable to dispute it, have usually exhibited a strong disposition to explain it away, this was not because they could discover any flaw in the argument itself, but because the contrary opinion seemed to rest upon arguments equally indisputable. In the syllogism last referred to, for example, is it not evident that the conclusion may, to the person to whom the syllogism

is presented, be actually and *bonâ fide* a new truth? Is it not a matter of daily experience that truths previously unthought of—facts which have not been, and cannot be directly observed, are arrived at by way of general reasoning? We believe that the Duke of Wellington is mortal. We do not know this by direct observation as long as he is not yet dead. It we were asked how, this being the case, we know the Duke to be mortal, we should probably answer, Because all men are so. Here, therefore, we arrive at the knowledge of a truth not (as yet) susceptible of observation, by a reasoning which admits of being exhibited in the following syllogism:—

All men are mortal,
The Duke of Wellington is a man,
therefore
The Duke of Wellington is mortal.

'And since a large portion of our knowledge is thus acquired, logicians have persisted in representing the syllogism as a process of inference or proof; though none of them has cleared up the difficulty which arises from the inconsistency between that assertion and the principle that if there be anything in the conclusion which was not already asserted in the premises, the argument is vicious. For it is impossible to attach any serious scientific value to such a mere salvo as the distinction drawn between being involved by implication in the premises, and being directly asserted in them. When Archbishop Whately says that the object of

reasoning is "merely to expand and unfold the assertions wrapt up, as it were, and implied in those with which we set out, and to bring a person to perceive and acknowledge the full force of that which he has admitted," he does not, I think, meet the real difficulty requiring to be explained, namely, how it happens that a science like geometry can be all "wrapt up" in a few definitions and axioms. Nor does the defence of the syllogism differ much from what its assailants urge against it as an accusation, when they charge it with being of no use except to those who seek to press the consequences of an admission into which a person has been entrapped without having considered and understood its full force. When you admitted the major premiss you asserted the conclusion. But, says Archbishop Whately, you asserted it by implication merely; this, however, can have only meant that you asserted it unconsciously; that you did not know you were asserting it; but if so, the difficulty revives in this shape—Ought you not to have known? Were you warranted in asserting the general proposition without having satisfied yourself of the truth of everything which it fairly includes? And if not, is not the syllogistic act *primâ facie* what its assailants affirm it to be, a contrivance for catching you in a trap, and holding you fast in it?' *

* 'It is hardly necessary to say that I am not contending for any such

'Section 3. From this difficulty there appears to be but one issue. The proposition that the Duke of Wellington is mortal is evidently an inference; it is got at as a conclusion from something else; but do we, in reality, conclude it from the proposition, All men are mortal? I answer, no.'

'The error committed is, I conceive, that of overlooking the distinction between two parts of the process of philosophising, the inferring part, and the registering part; and ascribing to the latter the functions of the former. The mistake is that of referring a person to his own notes for the origin of his knowledge. If a person is asked a question, and is at the moment unable to answer it, he may refresh his memory by turning to a memorandum which he carries about with him. But if he were asked how the fact came to his knowledge, he would scarcely answer because it was set down in his note-book, unless the book was written, like

absurdity as that we actually "ought to have known" and considered the case of every individual man, past, present, and future, before affirming that all men are mortal; although this interpretation has been, strangely enough, put upon the preceding observations. There is no difference between me and Archbishop Whately, or any other defender of the syllogism, on the practical part of the matter; I am only pointing out an inconsistency in the logical theory of it, as conceived by almost all writers. I do not say that a person who affirmed, before the Duke of Wellington was born, that all men are mortal, *knew* that the Duke of Wellington was mortal, but I do say that he asserted it, and I ask for an explanation of the apparent logical fallacy of adducing in proof of the Duke of Wellington's mortality a general statement which presupposes it. Finding no sufficient resolution of this difficulty in any of the writers on Logic, I have attempted to supply one.'

the Koran, with a quill from the wing of the angel Gabriel.'

'Assuming that the proposition, The Duke of Wellington is mortal, is immediately an inference from the proposition, All men are mortal; whence do we derive our knowledge of that general truth? Of course from observation. Now all which man can observe are individual cases. From all these general truths must be drawn, and into these they may be again resolved, for a general truth is but an aggregate of particular truths; a comprehensive expression by which a number of particular facts are affirmed or denied at once. But a general proposition is not merely a compendious form for recording and preserving in the memory a number of particular facts, all of which have been observed. Generalization is not a process of mere naming, it is also a process of inference. From instances which we have observed we feel warranted in concluding, that what we found true in these instances holds in all similar ones, past, present, and future, however numerous they may be. We then, by that valuable contrivance of language which enables us to speak of many as if they were one, record all that we have observed, together with all that we infer from our observations, in one concise expression; and have thus only one proposition, instead of an endless number, to remember or to communicate. The result of many observations and

inferences, and instructions for making innumerable inferences in unforeseen cases, are compressed into one short sentence. When, therefore, we conclude from the death of John and Thomas, and every other person we have heard of in whose case the experiment has been fairly tried, that the Duke of Wellington is mortal like the rest; we may indeed pass through the generalization, All men are mortal, as an intermediate stage; but it is not in the latter half of the process, the descent from all men to the Duke of Wellington, that the *inference* resides. The inference is finished when we have asserted that All men are mortal. What remains to be performed afterwards is merely the deciphering of our own notes.'

The whole gist of the controversy seems to me to lie in this question, Do we *assert*, when we say that 'All men are mortal,' that the unborn babe is mortal? If we do, then syllogism at least must resign all its pretensions to be considered as a method of inference, although even then Deduction in the wider sense, as comprehending more than these terms, may have claims to be considered which Mr. Mill has altogether ignored. It seems to me that since every assertion has no value except as representing thought, and as of unborn babies at large I nor any one else can have any thought whatsoever, no individual's assertion can at this moment apply to them. If my assertion, 'All men are mortal,'

be not true unless it apply at this moment to all possible future unborn babies, then since according to what we have before said no assertion as to possible future beings is at this moment either false or true, no universal proposition can logically be affirmed to be true.

The fact is, that Mr. Mill's analysis of the Universal proposition, as given in this passage, is not only self-contradictory, but is absolutely at variance with that which he himself gives when dealing with the Import of propositions. There, in analysing the very same universal proposition which we have before us in this passage, he reduces it at last to this form, as the best representative of the true thought expressed by it, Mortality constantly accompanies the attributes of Man. In the very chapter which precedes that from which we have taken our quotation, he declares that the general form of a universal proposition is, 'Attribute A is a mark of attribute B.' Now it seems to me that I may clearly make this latter assertion without thinking at all of the individuals which possess A and B respectively, and if this be the real form of a universal proposition, mankind at large will necessarily understand it in the sense in which I use it, that is, as not referring to a number, large or small, of individuals, but to the invariable co-existence of two attributes.

Now my assertion can express nothing except what I

mean by it, or what the majority of mankind will naturally understand me to mean by it. Yet according to Mr. Mill's own showing, neither do I in speaking think of a large number of individuals, nor do my hearers for a moment imagine that I intend to do so. How I can be said to have made any assertion about a thing which was neither in my mind at the moment of speaking, nor could possibly have been suggested to the mind of any who listened to me, I confess myself unable to conceive.

But we have not nearly got to the end of our difficulties. Mr. Mill admits that many truths previously unthought of are arrived at by general reasoning. We ask how this is, and how, if it be so, it can at the same time be true that general reasoning is capable of no inference, that is, at arriving at no truth? The answer is, that this general reasoning is not general reasoning. It is particular reasoning slightly disguised; I really think that the Duke of Wellington will die, not because all men will die, but because John, James, etc., have died. I ask, what logical connection have John and James with the Duke of Wellington? John's death is a separate fact, so is that of James, neither of them have any logical connection with any other fact, nor with each other. Even when the mind puts them together, it has no logical warrant in passing from them to anything else. Before John and James

are any use to me for an inference, I must transmute them by means of somewhat which is not in them, but which I add to them. This addition is that of which we have already treated when talking of universal propositions, and again in the chapter on Causation. It is a tacit assertion of the intention of expecting like results in similar cases. This assertion is precisely the universal portion of the proposition, and I affirm that without it any inference is impossible. We cannot argue from particular to particular without first in our own minds constituting the particular for the moment a universal—without making a mental addition to it.

Psychologically this mental addition may be explained in a fashion which will show that it is rather passive than active. It is closely connected with that which is ordinarily considered one of the most lamentable weaknesses of frail humanity—to wit, the deficiency of memory. When we have seen a great number of men and known that they all have died, the idea of death will be connected, not with each separate individual and his peculiarities, but with that which remains after those traits which are peculiar to each individual have vanished from our minds by lapse of time, that is, with the general idea of man. The connection Man—Mortal remains, and since the idea Man has now been stripped of all individual peculiarities, I shall doubtless find it applicable to the next individual of the species I come

across, and by applying it to him shall, through the connection of the general idea Man with the idea Mortal, be able to assert that the individual now presented to me for the first time is mortal.

Not only is it true that all inference must be made by means of a real universal proposition, but it is further the fact, that the inference is not made till the new individual presents himself to sensation or thought. The universal is a blank form; an affirmation of intention. It is not the cheque until it is filled up, which can only be done when the individual with his peculiarities, which render him a definite being in sensation or imagination, is before the one or the other. The filling up of the cheque, not the procuring of the form, is the true inference.

I have a definitely new piece of knowledge when I pass for the first time from the idea of the Duke of Wellington to the idea mortal (that this knowledge is in this case very trivial and unimportant, we shall see in the sequel, and the causes of its triviality, but what we shall have to say on that head will in no way affect the main argument). Every time that I acquire a new piece of knowledge there must either be an act of direct consciousness or an inference. In this case the only new piece of direct information is the real or fancied present existence of the Duke of Wellington; the further notion of his mortality must be therefore due

to an inference, and as the idea of the Duke of Wellington was by hypothesis not present to me before this moment, I could not until this moment have got the connection of ideas, Duke of Wellington—mortal, which constitutes my new piece of knowledge. It was therefore at this moment and no other that the inference was made.

The particular facts which have constituted our previous experience are indeed the material out of which the mind, by a peculiar act, forms the universal proposition from which again, after the addition of the particular instance, the conclusion is inferred, but the collection of the material or evidence is not the judgment. Affidavits of witnesses may be collected for years or months beforehand, but the criminal is only then condemned when the judge has pronounced sentence on him in his presence. In our case the criminal—the particular instance—has not yet been caught when the universal proposition is formulated, though the judge—the Reason—has announced his intention of sentencing him whensoever he is brought before him. Mr. Mill seems to confound the formulation of intention of performing an act when occasion occurs with the act itself; the assertion that if any one insults me I will knock him down, with the actual execution of the threat upon some offender. So much for the main issue.

Some of the corroboratory arguments by which Mr.

Mill supports his theory seem especially open to criticism. Thus, for instance, he attempts to establish a contradiction between the doctrine that the syllogism is or may be a real inference, and the logical dictum that there should be nothing in the conclusion except what is contained in the premises. But surely his argument is lame on both legs. There is nought in water besides hydrogen and oxygen. Yet water is not merely hydrogen and oxygen. There is the further fact of their mixture. So too there may be no matter in the conclusion but what is contained in the premises, but there is the further fact of the conjunction of those premises which may, and often does, constitute the conclusion, a thought different from either of the premises taken separately, or from the sum of both considered as standing apart from each other.

The argument as to the note-book would only hold good if the fact of the Duke of Wellington being mortal had been conceived before. If it has not, then, however the note-book may help us towards arriving at that thought, it at least does not contain it. For all more complicated cases of Deduction, I hold that my former illustration of the ledger which has not yet been added up, far more accurately represents the facts of the case than Mr. Mill's note-book.

The language of the note on section two, seems to me even more unguarded than that of the text. In what

conceivable sense of the word 'suppose' can the statement, All men are mortal be said to 'pre-suppose' the mortality of a number of possible creatures whose existence is not supposed by either speaker or hearers; about whom in fact nothing is or can be supposed.

As to the controversy with Archbishop Whately—that writer has undoubtedly stated his case in a form which laid him open to verbal criticism, but if we shall transform his statement into this, which is obviously its equivalent, 'the object of reasoning is merely to expand or make definite, by means of individual instances, assertions which as originally stated were merely vague and potential,' there will then be no question of unfairness or catching men in traps. The original speaker or the pupil has stated or agreed to a proposition in some such form as this, 'wherever I find certain signs, I shall be justified in assuming the presence of certain attributes.' When he made that assertion, he probably knew full well that he had not investigated all the instances which he or other men might come across, he only wished to declare that from his own experience, and what he had heard or knew of the experience of other men, he should expect the attributes to follow wherever the sign presented itself. His interlocutor or teacher then shows him a case which has not before arisen in his experience, in which the sign is present. According to his original statement, he must

naturally admit that he will now expect the presence of the attributes whereof he has asserted his intention of taking this sign as a ground of expectation in all cases. His original assertion may have been made on weak evidence or on strong (remembering always that there is no absolute strength or certainty), but, since he never imagined that the evidence covered all cases, and was therefore fully prepared to expect a like result in an instance not hitherto noticed; there can be no question of taking him off his guard or catching him in a trap.

I said above that the piece of knowledge conveyed by the inference from All men are mortal, to, The Duke of Wellington is a mortal, was a very trivial and unimportant one, and the reason of this statement will be evident to all who consider the distinction which we drew at the beginning of the chapter between syllogisms applied to natural real kinds and natural causes, and those which have to do with artificial classes; we saw there by instances that the former were useless for the increase of knowledge and the latter all-important. The explanation of this statement I have deferred till the present moment, because it seemed to come more conveniently and naturally after the criticism of a passage which in truth derives a great deal of its plausibility from the fact that the instance which is therein selected for discussion is one of those very

syllogisms as to Natural Kinds which we ourselves reject as valueless.

What, according to our former analysis, is a legitimate syllogism? It is the passage of the mind from one idea to another by means of a third, with which both are connected, from A to C through B. In order that the syllogism may be a legitimate mediate inference, each of these ideas must be perfectly distinct although connected. Now in cases of syllogisms in which the minor premise or instance asserts that an individual belongs to a Natural Kind, there are really not three ideas but two. The idea of man is not a separate idea from that of the Duke of Wellington, but a necessary part of that idea. In order that the syllogism shall be of any value as an instrument for conveying or arriving at knowledge, it is necessary that it should be possible that the first and third ideas should be present together in the mind, and that yet the second or connecting link should for the moment be absent, so that the connection between them should be unnoticed.

For instance, it is possible that I might know as a fact that All Whales were Mammals, and, again, that All Mammals had lungs; but when thinking of the question whether or no whales had lungs, it is not at all necessary that these two propositions, both of which I was theoretically aware of, should be at the moment present to my mind. Neither of the

two extreme ideas necessarily suggest the middle term, since, according to the doctrine I laid down in the second chapter, the class Mammal is an artificial one in reference to Whale, and therefore the idea of the whale does not necessarily contain the quality of giving suck to its young. If, however, I try to think of the two ideas Duke of Wellington and 'Mortal,' I must necessarily, at the same moment, think of the idea 'Man,' which is the connecting link between them, since that idea is involved in the idea Duke of Wellington, and cannot in any way be separated from it. The idea Duke of Wellington is the idea Man, with certain additions of individual peculiarities. I hold that when I say All men are mortal, The Duke of Wellington is a man, therefore the Duke of Wellington is mortal, I do indeed perform an inference, if I have never before thought of the Duke of Wellington in conjunction with the idea of mortality, but it is an inference which I cannot fail to make the moment I conceive the two extreme ideas together in consciousness. The connecting link between them is at once apparent, since it is a mere portion of one of them.

Now the whole art of Deductive or Syllogistic instruction or discovery consists in hitting upon some connecting link between ideas, from the one to the other of which the mind cannot directly pass. I know or may know a great many truths about whales besides

the fact that they may be placed in the artificial class of Mammalia, I know a good many things about creatures which have lungs besides the fact that All Mammals are amongst them, but none of the other truths which I know about whales or lungs will enable me to connect the idea of the former with the notion of the possession of the latter. If I find then a connecting link between two ideas such as those which we have just discussed, it is extremely probable that my fellow men may not yet have made this discovery, and it is therefore worth while to convey it to them in the form in which I discovered it: Whale—Mammal—Creature with lungs. In the former case the connecting link is at once obvious to any one who brings together the two extreme ideas Duke of Wellington and Mortal, and I can do no good by stating it. I assume, of course, in both cases that the propositions on which the syllogisms rest are known to all mankind.

The most serious and weighty objection that has ever been raised against the syllogism seems to me to be that of Locke, as urged in his chapter on Reason (the 17th of the 4th Book of the Essay on the Human Understanding), where he asserts that syllogism does not represent but perverts the natural order of thought. That no man naturally reasons in this order Man-Animal; Negro Man; Negro Animal, but in the simpler and more rational order Negro Man Animal; or if

it be written out in full, Negro Man Man Animal, therefore Negro Animal.

This objection I hold to be entirely valid, but it tells nothing against the Deductive Method, which consists merely in placing the intermediate idea Man between Negro and Animal, in order to facilitate or render possible the passage of thought from one of these two extreme ideas to the other. It at most points out that the ordinarily accepted form of syllogism does not duly represent the deductive process. And this is indubitably true. The term or idea which forms the connecting link between two other terms or ideas, must come midway in thought, and should therefore be placed in the middle in the form which aims at representing the process of thought. The modern syllogism in its most common form, represents us when attempting to pass from C to A through B, which is known to be connected with each, as first beginning with B and going on to A, then starting back to C and proceeding to B (all B is A; all C is B, therefore all C is A). This surely is a very roundabout way of journeying from C to A; we should naturally either begin with A, pass through B, and arrive at C, or conversely start with C, and through B pass to A.

It is observable, however, that Locke's objection only applies to the modern form of syllogism, and

not to that propounded by Aristotle, who at least introduced into Europe, if he did not discover,* the use of the syllogistic form. With him the 'Perfect Syllogism' is that wherein the connecting link in thought is also the middle term in speech. The syllogism will have two forms according as we proceed from A, the widest term, to C, the narrowest, or from C inversely to A. We may either say A belongs to all B, B to all C, therefore A to all C (mortality to all animals, the being animals to all men, therefore the being mortal to all men), or conversely All C is B, all B is A, therefore all C is A (all men are animals; all animals are mortal, therefore all men are mortal). But whichever form we may adopt, the connecting link B still comes midmost in speech as it does in thought. The syllogism is a true representative of our mental process, and escapes the criticism of Locke.

We have seen then that both Syllogism when properly treated, and still more Deduction at large, are methods by which the knowledge both of individuals

* The question as to the probability of Aristotle having borrowed his scheme of the syllogism from the Nyaya of Gotama, through his nephew Callisthenes, who accompanied Alexander to India, and had certainly opportunities of communication with the learned Brahmins, is a very interesting one, and still awaits certain solution. I must confess that the arguments of St. Hilaire, who strenuously supports the originality of Aristotle, do not altogether convince me. (Cf. Barthélemy St. Hilaire, 'Le Nyaya,' Part III. p. 237, in 'Mémoires de l'Académie,' tome III. 2me Série; Sir W. Jones' Works, vol. I. p. 164; Colebrooke, Essays, VII. Part II.)

and of mankind in general may in truth be increased. Further, that the essence of all Deductive Reasoning is the insertion of one or more ideas as intermediate steps between two extreme ideas whose connection is not immediately obvious. Whether the intermediate steps be one or many, matters not one whit as far as the nature of the process is concerned. By far the most numerous and important instances of the Deductive Method contain, however, a very large number of intermediate terms. The attempt to reduce such reasonings into the form of a chain of syllogisms would be about as rational as the transformation of all calculations into a scale of notation whereof the highest digit was 3.

CHAPTER VII.

ON THE MATTER OF THOUGHT.

WHAT is present in the mind when we think? Ideas. Granted; but the answer does not lead us far, since in this sense an Idea is merely any representative state of consciousness, as opposed to Sensations, Emotions, and Activities, which are the direct or primitive states which those ideas represent. Any of the immediate states of consciousness may give rise to or be the first step of a train of thought, but it is obvious that any further steps must be taken by means of ideas. Thought is usually at highest when sensation, emotion, and activity (other than that of thought itself) are at lowest. It is obvious then that these three cannot immediately and at the moment supply the fuel which supports the flame of thought. It remains that this fuel should be furnished by the only other material which can be present to the mind—to wit—the ideas or representations of past sensations, emotions, or activities which are stored up within it.

The true question before us is, Does the mind in

thinking use all kinds of ideas indifferently, or is there any one class of ideas to which it accords a preference partial or exclusive? In all that we have said in the preceding chapters we have assumed no such exclusive preference, but have spoken as if any idea whatsoever might be and ordinarily was used by the mind, as first, second, third, and so on to last term of any process of reasoning or argument. In so doing we have followed the invariable custom of all writers on the subject; but if we shall discover that the human mind, that at least of man as we now know him, employs almost exclusively one class of ideas in thought, we shall have to this extent to modify our former statements. All that we have said will still be true as to the way in which mankind might reason, and still perhaps occasionally does reason; but in order duly to represent the ordinary process of thought we shall have to substitute for the word idea, some narrower name which belongs to the class of ideas habitually employed in thought, and to those only.

Ideas we have said are representations of emotions, activities, and sensations. Now in composing or thinking out the last few pages, what class of ideas have I used? I have obviously had present to my mind no representations of emotions or activities, since the subject is neither tragic nor comic, neither historical nor hortative. I have, as far as I can analyse my own conscious-

ness, had present to that consciousness no representations of visible objects,* no notions of smell or touch, still less any of taste. There remain only one order of ideas—those which represent sensations of sound. Of these, I have thought neither of notes of music, nor of beasts bellowing, nor of any irrational or non-human sound whatsoever. Words only have been represented in my consciousness, and my thought has flowed on from one of them to the other without stopping, except perhaps at rare intervals, at the beginning or end of an argument, to consider at all what are the ideas or mental images of direct states of consciousness (other than the sounds of human speech) which the words of which I have been thinking represent. When my thought has been most intense, I have at times been conscious of the fact that I was half-forming my mouth to the articulation of those sounds whose representations were passing along in review in my mind. Is my thought to be condemned as valueless by reason of this my confusion? Must it be said that the whole argument is '*Mere Words*.' I am confident that if I am cast on this charge, all the ordinary reasoning of any civilized man will fall under a like condemnation. Let any man ask himself honestly how many times in an hour's serious thought he forms or uses the representation or mental image of aught else than sounds of spoken speech,

* This I must perhaps qualify by what comes hereafter (p. 232, etc.).

I am ready to wager that he will have no difficulty in counting those times on the fingers of one hand.

The fact is that except when our consciousness is so taken up with direct sensations that thought is almost excluded; or when, on the other hand we are sunk in one of those delicious reveries when thought is at slowest, and when we pass lazily and luxuriously from one lovely image to another, the whole of our waking consciousness is an almost unbroken passage of long strings of words through the mind. Not only is this the case, but it becomes ever more and more so as mankind advances in the scale of civilization. I shall first attempt to prove this apparent paradox, and to show that this substitution of ideas of words for other mental images as the material of thought is part of the great process of the advance of civilization and the fitting of man for his circumstances. I shall then answer the objections which seem to rise against the doctrine, both from the side of philosophy and that of plain common sense. I shall show that some very curious and interesting consequences can be drawn from it which explain facts that have already been observed, but seem as yet to lack elucidation, and I shall finish the subject with a Utopian extension of the progress historically observed, which the reader may if he pleases reject as absurd as a prophecy, but which will, as I hope, at least serve to render

more clearly understandable what I assert as to the past advance of the Human Race.

The savage lives much with nature and little with his fellow-men. He hunts or tends his flocks alone, or with but few companions, and with them exchanges in the day but few words. If he returns to his village in the evening he sits almost silent by the camp-fire, or takes part in monotonous songs unvaried from night to night, and full of refrains and repetitions. His language is limited perhaps to a hundred words, and those words are themselves for the most part not arbitrary and distinct signs whereof several must be conjoined to describe even the most simple experience, but complex word-sentences un-distinct into parts, each one of which, aided most commonly by gestures, is intended to imitate an experience. The sound is either a repetition of some natural noise actually heard, or it is such a sound as might usually be emitted by a person or thing performing the activity which he desires to describe (compare the child's puff-puff for train, gee-gee for horse). It has neither verb nor noun, neither grammar nor arrangement. It is simply a representation (as nearly as may be an imitation) of some sensation, emotion, or activity, or of some sound which usually accompanies such.

Meanwhile at all times when his consciousness is not taken up by direct sensation or emotion, the savage

thinks; for no mind in its waking moments is ever absolutely unoccupied. Of what do his thoughts consist? Not of words, for of those he has but few, and they themselves are merely imperfect images of his experience; but of direct reproductions of that experience itself. He thinks of last year's hunt or yesterday's meal. Each detail of the picture is slowly revived in memory, and from this picture he gradually passes to some other suggested by it, which again has to be completed in its details, more or less distinctly, before he is ready to pass from it to another. Slow is the thought of the savage, for the occasions when he has to reason are few, and his surroundings are simple, and change but little from year to year. He but rarely arrives by reasoning at a new truth, but he has few occasions for seeking for one. Meanwhile his imagination will be at its vividest. His power of conjuring up a scene in all its details will be much greater than that of more civilized man. It may well be that the deficiency of language of which we have already spoken, will prevent him from communicating to civilized observers the full vividness of the picture which he raises up before his own eyes; but when he attempts to describe any strange phænomenon, his language, if he have arrived at a sufficient stage of cultivation to have distinct language, will be full of those word-images which have so greatly and so often impressed observers

with the unconscious poetry of the savage. Every name of a man or beast will be a picturesque description —an attempt to arouse in the hearer the picture which the speaker himself attempts to form the moment that name is mentioned.

When he advances to the further stage of representing to the eye the names which he has hitherto addressed to the ear only, his representations will all take the form of pictures. There will, as far as may be, be nothing conventional or arbitrary either in his spoken or his written language. Here then we get the thought of which philosophers usually treat, which consists of a succession of ideas or images of actual observed phænomena, suggesting each other in the order of observation. The primitive savage alone possesses in its purity the form of thought usually described as though it were universal.

As mankind advances to the higher stages of civilization a double change goes on. It becomes more and more impossible, as the experience of the individual becomes ever wider, at all to represent that experience to his fellow-men by imitative sounds and gestures. The imitative sound which expressed horse (whether it reproduced the neigh, the sound of the hoofs, or the noise of the driver) will not enable the hearer to ascertain whether mare, pony, or colt is meant to be represented. Affixes and suffixes have to be added to the

original sounds, in order to represent these distinctions, which, as life advances in complexity, become ever more important. These additions may themselves have been originally imitative, as for instance, if the imitative word for elephant be used as an affix to the name of any other animal to represent greatness; thus the imitative sounds representing elephant-horse will be put together to represent a breed of big English horses, as distinguished from the ponies before known in the country;* but in the compound word thus formed, the affix representing elephant is purely conventional. It is not intended to raise the image of the elephant (whose trumpeting or what-not it imitates), but to qualify the notion raised by the imitative word for horse, so as to raise in the mind of the hearer the notion of a distinct though allied species. Gradually the separate natural meanings of the parts of the common word become altogether obliterated, and the word is reduced to a purely conventional sign for a breed of animals. The wider the experience of natural objects, the more entirely conventional do their names become.

Nor is this all; the sentence was originally a mere picture of some sensation or action; the person who performed the action or experienced the sensation was always indicated by gesture; so too present events were

* Compare the actual use in Hebrew of the word God to represent greatness. Hill of God = Great Hill, and so forth.

only distinguished from past by some natural signs such as stretching out the hands to indicate events in the past or future.* But when, in the increased complexity of advancing civilization, it is necessary to indicate the actions of distant persons to whom we cannot point, to show whether they be one or more, and again whether the events be past or future (which our pointing outwards does not show), still more when distinctions have to be made between different lengths of past time; the verb, the pronoun, and the other parts of speech necessarily emerge, and we have the grammatical sentence distinct into parts and altogether conventional. This is one side of the change.

Simultaneously with this progress mankind lives ever more and more with his fellow-men, and uttered or written words form continually a larger and more important portion of his direct experience. Consider how small a portion there is in the daily experience of any one of us which is aught else than words. The trade of the politician, of the barrister, of the preacher, consists in nothing but in arranging, uttering, and listening to, words. Those of us who have leisure expend almost the whole of it either in society or in reading. Continually we have new words and combinations of words presented to us, but how rarely new

* Cf. Mr. Tylor's 'Primitive Culture,' chapters v. and vi., especially pp. 163–4, second edition.

things! Even the artizan or labourer, whose work lies mainly with his hands, after his apprenticeship has passed away, gets little new experience except of words. His work, repeated day after day, suggests no new thoughts; and his whole mental food consists in the conversation of the ale-house or the club, where he hears or reads the newspaper, and discusses politics or the state of the crops. Put aside those who travel or make experiments, and we may safely say that for the rest of mankind direct consciousness is aroused by words ten times for every once that it is excited by all the other sensations and emotions put together.

It may be objected that written words are not the same things, considered as elements of consciousness, as spoken words; that the one are sensations of the eye, and the other of the ear, and that therefore that which we read should not be counted as increasing our experience of audible words, unless indeed we read aloud. This I believe to be so far a true objection, that highly civilized individuals do not when reading mentally translate the written words into oral ones, but can if need be, and do at intervals throughout their reading, pass directly from the written word to the idea of the thing, without the intervention of the idea of the sound of the name. But this, as I shall show more at length in the Utopian portion of this chapter, is merely a further development of the process which I am here describing

of thinking by means of signs without the imagining of the thing signified, since the written words are the representatives, not directly of the thing, but of the pronunciation of the name.

This, however, is a very high development, with which we need not now concern ourselves; it may suffice us to notice that the learner always, and a great portion of readers throughout their lives, do as they read translate in their minds each written word into its corresponding audible sound. Let him who doubts it go into the tap-room of the nearest inn, and listen to the muttering of the respectable farmer as he cons over his *Standard.*

The next stage is that wherein the translation into ideas of audible sounds, though still performed, is entirely a mental process, unaided by the actual or partial utterance of those sounds. This is the stage at which the great majority of readers have, as I believe, arrived. Above and below it there are other stages, in the lower of which certain hard words are audibly pronounced, and in the higher the commoner words are not even conceived as sounds in the mind, but remain as marks which the eye and the mind rapidly pass over without translating into ideas of sound; using them to qualify the less common words which are still so translated. To all who in any way translate into notions of uttered words those written or printed words which they have before their eyes, the operation of reading does

increase that portion of consciousness which is given up to articulate sounds and their representations.

Since, then, a continually increasing portion of man's actual experience consists of words, that is, audible articulate sounds, it follows, according to the law of thought which is acknowledged by all philosophers, that a continually increasing portion of his representative consciousness will consist of ideas of words. Moreover, as the words become more and more entirely conventional, it will become more and more difficult to translate each word or combination of words into the thing signified by them; the image of a ferocious warrior will be less directly aroused by the name Tamerlane than by the appellation Crouching Tiger or Orang-Outang, especially if the syllables composing the names of these animals are real imitations of their cries. The fact must be acknowledged that representative thought becomes slower and more difficult as civilization advances. If, then, every word used in an argument is or ought to be translated into the idea for which it stands, before we can legitimately pass on to the next, the civilized man with his conventional vocabulary will fall far behind the simpler savage in rapidity of thought and reasoning. As it is obvious that the exact reverse of this is the case, we must again, and from an independent ground, conclude that the greater part of these reasonings are conducted by

means of trains of words, along which the mind passes without the least attempt at translating these words into the ideas of things of which they are the representatives.

Now the questions which we have to answer are, First, what is the character of that thought which is conducted entirely, or almost entirely, by means of ideas of words; Secondly, is the change from picture-thought to verbal-thought an improvement or the reverse? Our answer to the first of these questions will manifestly determine the reply which we have to give to the second.

What is the nature of verbal thought, we shall best understand, if we remember that the words at least of a civilized language are mere arbitrary symbols of things. All thought conducted directly by means of words is symbolic. It has no meaning as affecting life till it be re-translated into terms of the sensations, etc., for which the words stand. But in a reasoning process it is neither necessary nor possible that each step should be thus translated; all that is necessary is that the starting-point should represent a real experience, and that at the close of the argument the conclusion should be represented to the mind in terms of ideas which are the real images of sensation; the intermediate terms, however many they may be, need never be thus translated.

Suppose I notice that a certain person has a mark on his arm, and am anxious to discover whether he is to be trusted. I may arrange a deduction in this form. The person before me has a certain mark on the arm, all persons with this mark have been branded by the military authorities. All those who have been branded by the military authorities have committed a serious offence, No persons who have committed such serious offences are to be trusted, therefore this person is not to be trusted. Here the first proposition represents my experience at this moment, and the last proposition or conclusion must be translated as picturing me to abstain from any act which I may have contemplated, implying trust in the person before me. But all the intermediate propositions are in my thought mere conjunctions of words, and so remain. If I really translated the second proposition into terms of the ideas for which the words stand, I should have to think of a number of persons whom I had seen or heard of with this mark, and of the scene in the barracks or prison-yard wherein each of them had had the mark inflicted; since it is obvious that there have not been enough cases to give me a true general idea of all persons who have this mark. As a matter of fact I probably have had no experience of such a scene, I may never even have seen an account of any individual case; I have simply taken the formula from others who I believe

have had sufficient evidence on which to establish it, and use it for the purpose of forming a connecting link in my argument, without for a moment thinking of the number of pictures which its terms, when translated into sensational ideas, would give rise to. Did I attempt to give sensational or emotional values to each proposition involved in this argument, I could arrive at no decision till after a very considerable space of time; whereas I am conscious in this case, and in all similar ones, that my thought passes through the different steps with lightning-like rapidity.

The process will, perhaps, be more clearly understood if we consider another mental process which is Universally acknowledged to be symbolical. I mean the manipulation of algebraical signs. In all problems in algebra, I begin by assigning to my constant quantities a, b, c, etc., values determined by the facts of the question. I also consider the unknown quantities to be definite things, whose *nature* is determined by the conditions of the question, but whose *number* is to be discovered. (Let x stand for the eggs in the basket; or y for the chance of cutting a given card.) But the moment I begin my manipulation of the symbols, I for the time being forget all my knowledge of the real nature of x and y; a and b. They are now symbols, and nothing more, to be added together and divided, to be cubed and eliminated, and to submit to any other

manipulation which the laws of algebra allow. Beyond the symbols I do not for a moment look, till I arrive at the close of the problem, but when I have at last got the simple result $x = 8$ or $y = \frac{3}{40}$, I suddenly again bethink me of my eggs or my cards, and say that the number of eggs in the basket was 8, or that the chances against cutting the card are 37 to 3.

Now all the thinking processes of civilized men are performed by a species of mental algebra. Instead of a and b, we have words which, until translated into terms of the sensational or emotional ideas for which they stand, are equally meaningless. We know that according to laws which have been discovered by ourselves or others, we may pass from the word A to the word B, and from that to the word C. Of course we are only justified in passing from the word A to the word B if the thing or sensation whereof A is the name, is always indissolubly connected in past experience with that whereof B is the name, and so too with B and C, but at the moment of reasoning we think not at all of the evidence which warrants us in passing from A to B, but simply remember the formula All A is B, and so too the formula All B is C. If, indeed, we even analyse so much as this, and do not rather instantly pass along from word to word after this fashion, Large-headed baby—water on the brain—idiotcy or early death.

That which starts the train of reflection or reasoning,

which as it were gives value to our algebraic symbols, is always some direct consciousness, a sensation, activity, or emotion; we are anxious to discover whether this state of consciousness is or is not connected with some other—whether the mushroom or fungus in our hand is or is not poisonous. In order to connect the fungus with poisonous or non-poisonous qualities, we run through a string of propositions whereof the last but one asserts that all things which have a given mark are poisonous or not as the case may be, which mark has been, through one or more other propositions, proved to belong or not to belong to the mushroom before us; and then the conclusion comes that this mushroom is or is not poisonous.

This conclusion we translate into real representative ideas—we imagine ourselves being injured or unharmed by eating the mushroom, and accordingly either throw it away, or put it into our basket; but all the intermediate steps remain combinations of words and of words only. This is the case if we are quite sure of all our formulæ, but if there be any one of them about which we feel any doubt we stop midway, and apply to that formula the only possible test. We translate the proposition into terms of the picture-ideas for which it stands, and ask ourselves whether we feel that there is a real connection between these ideas and on what experience, whether of ourselves or others, this connection is based. Doubt causes us to

return to the primitive method of the savage, and to use his slower but surer process.

For it must be admitted that our mental algebra does greatly increase the possibilities of error. If an erroneous combination of ideas be formed by a freak of fancy, or by neglecting the negative evidence, each time we view the two ideas together; while we confine ourselves to picture-thinking, we are likely to discover that the connection between them is not so strong as we imagined, nor founded on such invariable experience. But when once that connection is expressed in a verbal formula, as All Money-lenders are Scamps, that formula is used without any investigation of its force, and may often form an intermediate link between two ideas which are really disjoined, and which could not be brought together except by this faulty connecting line. And as long as the proposition is used only as such an intermediate formula, it will never be translated into terms of picture-ideas except by him who doubts its validity, and therefore its faultiness, if it be faulty, will run no risk of discovery.

And this brings us to our second question: Do we on the whole gain or lose by the substitution of symbolic for picture-thought? The question might be answered at once without reference to the immediate facts of the case by saying, that since the substitution of symbols for pictures in thought is simultaneous with the growth of complexity in the surrounding circumstances; Since it

is at once the product (in common parlance) of these circumstances and is part of the process of adjustment to those circumstances; it must, unless it defeats its own object, render man more fit for his new circumstances, than he would have been if he had remained unchanged as to the operations of his mind, while all things around him moved onward. No step in this process of development can be vain or fruitless simply because the process itself consists in the removal by gradual extinction of all beings which are less fitted for their new circumstances, and the survival of those best suited to them. It follows then that any alteration produced by this process leaves mankind in a better condition for adjusting themselves to their new circumstances than they would have been if the alteration had not been made.

But without betaking ourselves to this '*à priori*' and cavalier method of settling the question, let us attempt to strike a real balance of gain and loss. We will take the loss first, and see wherein it consists. We have already referred to one great inconvenience of symbolic thought—the impossibility of testing our formulæ as we go along. With this is closely connected another drawback. Every formula, be its evidence strong or weak, is strengthened *as a mental formula* each time it is used. Ideas of words, like all other ideas, are connected with a strength in proportion to the number of times, either the words themselves or the ideas have been brought into

connection in past consciousness. Now the strength of the connection of the words ought to represent the strength of the connection of the sensations or things, which those words are the signs of, as presented in past experience. But if, as we have seen, each new occasion on which we use the verbal formula strengthens the connection of the ideas of the words, it is obvious that after frequent repetition of that formula an increased strength of connection between the words will be produced without any corresponding increase of strength of connection between the things as presented in experience. We shall use our formula as worth a good deal more than it really is. Nor is this all; the name and that of which it is the name become so indissolubly connected in thought that we often think backwards from the name to the thing; from an increased strength of connection between two names we really get an increased strength of connection between the ideas of the two things whereof they are the names, and thus lose or impair our only safe test for the value of our word-formula—The reading of it back into the representative ideas for which the words stands. Who does not know that, if he has used an argument or repeated a story a sufficient number of times, the validity of the argument or the truth of the story seems established for him by the mere fact of the frequent repetition? The words suggest each other with such facility in their accustomed order, that it is hard

to believe the ideas for which the words stand are not equally closely combined, and that further this conjunction of ideas is not due to a clear and undoubted conjunction of the phænomena of which those ideas are the images.

The drawbacks, then, of all word-thinking, as in fact of all speech, are the exaggeration of experience, by the assigning of a fictitious strength to connections of ideas, far higher than that warranted by the connection of phænomena themselves in experience, and depending to a great extent upon the entirely extraneous circumstance of the number of the times that the proposition representing this connection has been used in speech or thought—and further the crystallization of error if an initial mistake has been committed.

But against these drawbacks how great are the advantages! We may safely assert that no discovery which depended upon any long train of argument would ever have been made had mankind remained dependent on picture-thought. Further than that, we may assert that no book could have been written, and that any reasoned argument, exceeding a few words in length, could neither have been uttered nor understood by any audience. We can reason faster than we can speak because we can frame the simple notions of words so much faster than we can utter them, that we have space in the interval to think of their connections. But let

anyone take a simple descriptive or argumentative sentence and attempt really to form in his mind the pictures suggested by each separate word which it contains (excluding, of course, mere qualifying words which mark not new ideas but variations of an idea), he will find, I think, that to perform such a task, even in the most perfunctory manner, will take him a far longer time than would be necessary for the mere utterance of the sentence; which yet itself, as we have seen, is slower than the symbolic thinking thereof.

The difference between symbolic and picture-thought may be likened to that between travelling by canal-boat and by express-train. The former is undoubtedly safer, but, on the other hand, it is so much slower, that it is admittedly unfitted for the demands of civilised life. If we stick to the canal-boat we shall escape accidents which may undoubtedly overtake our rivals who travel express, but if we trade at the same market they will daily forestall us, and instead of the chance of a railway smash, we shall have the certainty of losing our trade, and eventually, if we still adhere to our old-fashioned means of locomotion, of dying of hunger.

We are now prepared to deal with the strictures of the philosophers. These have almost all been mere tirades against those defects, which we have admitted to be inherent in symbolic thought, without any attempt

at a due appreciation of the countervailing benefits. Thus, for instance, Bacon, in the 55th aphorism of the First Part of the Novum Organon, dilates at length on the tendency of words to react on thought, and to substitute their own connections, which for the most part depend upon the mere casual observation of the vulgar, for the wider and more important connections of things which philosophers have observed and would insist upon. He declares the necessity of referring all such supposed connections to the test of experience; a useful caution at a time when verbal connections were apt to be too lightly and incautiously established, but which after all is only a caution which could at no time be applied more than occasionally, and which now-a-days is perhaps less important than in the time of Bacon, since through the general diffusion of education, the opinion of the enlightened acts more directly and fully upon the mass, and very few new verbal connections are established which do not accord with the opinion of the educated classes. Newspaper dicta are substituted for popular aphorisms, and—sneer who will—the substitution is that of enlightened opinion for ignorant guesswork; since the newspaper writer, whatever may be the defects of his own education, is careful as a rule to make no statement which shall display ignorance, that is, which shall be in disaccord with the opinion of the truly educated. For the rest, Bacon does not touch

upon the question of the value or demerit of verbal symbols as instruments of thought, for the simple reason that his powerful intellect, being attracted rather to external nature than to the operations of mind, he had not proceeded so far in his analysis of thought as to discover that word-ideas have almost entirely superseded the old pictures of phænomena as instruments of reason. His criticism is just as far as it goes, but does not reach the root of the question.

When, however, we pass from Bacon to Locke, the analysis of thought has made a great step. In the Essay on the Human Understanding we come across this passage. "To form a clear notion of truth, it is very necessary to consider truth of thought and truth of words, distinctly one from another; but yet it is very difficult to treat of them asunder; because it is unavoidable, in treating of mental propositions, to make use of words; and then the instances given of mental propositions cease immediately to be barely mental, and become verbal. For a mental proposition being nothing but a bare consideration of the ideas as they are in our minds stripped of names, they lose the nature of purely mental propositions as soon as they are put into words. And that which makes it yet harder to treat of mental and verbal propositions separately, is, that most men, if not all, in their thinkings and reasonings within themselves, make use of words instead of ideas, at least when

the subject of their meditation contains in it complex ideas."*

Here then is a glimpse of the true theory which only needs the cutting out of all qualifications and exceptions to make it a precise statement of that which we have been at such pains to prove. Nor are even these exceptions without interest. It is quite true that we are more directly conscious that our thought is merely symbolic when we are dealing with complex and abstract ideas like those of Generosity or Benevolence, than we are when concerned with comparatively simple and concrete ones, such as that of the Dog or of the Horse. The reason of this is two-fold. In the first place the arousing in ourselves the complex notion of Generosity involves the passing rapidly over in the mind a number of other simpler notions of which it is compounded—those I mean of a Giver and of a Receiver, of a certain action, and of the spirit in which it is performed, all of which form necessary elements of that complex idea. Now it is obviously impossible that we can have performed all this complex analysis and running over of simpler notions in the time that we have formulated or uttered in a rational discourse the first few syllables of some such proposition as this, Generosity is a Virtue. We have really and obviously merely asserted that the

* Locke's 'Essay on the Human Understanding,' Book IV. chapter v. *ad init.*

names are applicable, the former to the latter, by common consent of mankind, and we pass immediately to some other name-connecting formula as we hasten on towards our conclusion. The notion of Dog or of Horse, on the other hand, is simply and quickly attained, and it really would not much delay discourse if we actually did pause to translate such a term into the idea for which it stands whenever it occurs; though I apprehend that we never in fact do so when the term forms one of the connecting links of an argument or discourse. In the second place the notions Dog, Horse, etc., were clearly formed in the consciousness of man at the time when his thought was really a series of pictures and not at all symbolic. When first names were given to these ideas, they were still always translated when spoken into the idea whose name they were. Now such complex ideas as generosity, etc., were not evolved till man had progressed far in civilization; till his thought was already becoming daily more entirely symbolic. From the very beginning these words were frequently used in discourse and in thought without being translated; the tendency therefore to translate them will be less strong than that which urges us to express in ideas words which (or the prototypes of which) mankind were for ages in the habit of so translating on every occasion of using them.

So far then, Locke's doctrine, though not exactly in accordance with our own, is at least to a very consider-

able extent an anticipation of it, and his very exceptions, although they seem untenable, do none the less furnish valuable hints and sidelights with which we may illustrate our system. But when we come to ask with what spirit he regards this change in the nature of the thought of the Human Race which he was at least partially aware of, we find that he views it with grief and apprehension. He sees that the Picture-thought is clearer and less liable to error than the Word-thought, and he at once decides, without giving the other side a hearing, that the former is to be preferred to the latter. Perhaps it was impossible for any thinker who had not arrived at the main principle that all progress is adjustment to varying circumstances, duly to estimate the importance of rapidity in mental operations. If it mattered not at what pace we thought, Picture-thought would still be preferable to that which we have now adopted. But the fact that a portion of the progress of mankind is the adoption of this more rapid if less certain style of thinking, proves irresistibly that the gain in pace more than counterbalances the increased risk of error in enabling us to fit ourselves for life in this quickly-changing universe.

As it is with Locke so also is it with almost all subsequent philosophers, though they have not all arrived at his point—the discovery that at least a portion of our reasoning processes must necessarily be conducted by means of ideas of words. They all join in the outcry

against the danger of substituting words for thoughts, and of using words which have no thought behind them —an outcry which would be perfectly justified, if they first warned us that we must necessarily do so in most cases, and that all their declamation really means is this, that we should never use mental formulæ consisting of words or conjunctions of words, if we have the least doubt that those conjunctions truly represent a conjunction of ideas dependent upon direct experience of ourselves or others. But of this explanation I find no trace in any of their writings, and without it their arraignment of words and of verbal thought can but confuse the question and suggest to men's minds that the ideal of a reasoning process is the simple method of the savage.

Let us now turn to the plain common sense of the vulgar, and ask what it has got to say against our theory. It is a tribunal to whose decision we attach much more importance than to any dictum of the philosophers. It declares at once that when it wishes to condemn any specious theory as unsound, it is in the habit of asserting that the reasoning on which such a theory is based is 'Mere Words.' That if according to our statement this charge might be truly brought against reasoning at large, it is at a loss to assign a value to its expression of condemnation, which it is yet conscious is used neither idly nor without meaning. It will not,

I think, be hard to show, consistently with our theory, both that Common Sense is justified in its condemnation of certain forms of argument and what is the precise meaning of that condemnation.

Arguments which may be condemned as *mere words*, are, then, first, and most obviously, those wherein one or more of the formulæ used in the argument consists of conjunctions of words which are not warranted by the conjunction in the mind of the ideas which the words represent, or where that conjunction of ideas, if it does exist, is a mere reflex of the conjunction of words, and does not depend upon direct experience. Secondly, Common Sense frequently rejects an argument as *mere words* when, although it can find no such flaw in the several verbal formulæ which are passed through in order to arrive at the conclusion, it yet feels that the result is in contradiction to some clear and definite experience. Here Common Sense occasionally errs in mistaking some interpretation of experience which it habitually makes for that experience itself. Thus, for instance, it might have, and for some time did, affirm the Copernican theory to be mere words, because it was in the habit of explaining certain phænomena which it daily observed by the supposition that the sun moved round the earth, although the phænomena were equally explicable on the Copernican hypothesis. But I believe that in a great number, if not in the majority of cases

Common Sense is justified in rejecting theories wherein argument is, or seems to be, opposed to direct experience.

We have already seen that the conjunction between two ideas as expressed in a proposition can never imply absolute certainty of the connection of the two phænomena which the ideas represented, but merely a greater or less expectation, founded upon a wider and more uniform or narrower and more chequered experience; further, that by combining a number of these propositions to arrive at a result, we shall only be justified in rising to an expectation of that result, considerably less than that which belonged to any one of the propositions which we had used in the process. The justifiable certainty will decrease with every step of the argument, and if the intermediate steps be many, the deductive evidence for the result of the argument will be really less strong than any well-ascertained direct experience against, even although it be true that each proposition in the argument rests its validity not on a single experience but on many. In such cases as these Common Sense sees that the conjunction of words in the result or conclusion of the argument does not represent a conjunction of ideas or things, but of names and names only. The contradictory experience prevents the imagination from combining the ideas of the things whose names are combined in the conclusion, and that con-

clusion, although it may be the result of honest and careful labour, is put aside as a mere sophism. Sooner or later some new experience will doubtless set limits to the generality of one of the propositions in the argument, and will be said to explain the failure of the deduction, but, as we have over and over again stated, every universal proposition is for ever liable to some new limitation.

We see, then, that the two classes of arguments which Common Sense rejects as *mere words* are, first, those which make a wrongful and careless employment of symbolic thinking; and, secondly, those whose conclusion is erroneous by reason of a limitation of thought, which applies equally to symbolic and to picture-thinking, although error is less likely to result in this latter process, simply because it is impossible to carry on by means of it an argument with any considerable number of terms. In both cases it is by reason of an obvious flaw in the conclusion that Common Sense condemns the process. Were the conclusion capable of being translated into picture-thought in a form which should not contradict experience, Common Sense would accept it at once, and be quite content with the series of untranslated verbal formulæ through which it was obtained.

Now, we have throughout insisted on the necessity of the translation of the conclusion into picture-thought,

and on the fact that men, when they have finished an argument, do, if they are not hurrying on to another, habitually so translate their result; so that on this point, as I hope and believe on all others, Common Sense and our system are at one.

I promised that our theory, when proved and illus trated, should be applied to the explanation of some already observed but as yet unaccounted-for facts. Here is one of them. It has often been noticed that persons of a strong imagination are usually of a somewhat dreamy temperament, and inapt for severe reasoning, and still more for rapid argument. The explanation is ready to hand. Such persons still think to a much greater extent than the majority of their fellow men, by means of real images. They are poets or painters, men of genius, perhaps, who delight us with the vividness with which they see pictures, which we pass by unnoticed. But none the less is their strength a weakness when considered as affecting their capacity for running in the great race of life; unless a surprising vigour of mind counterbalances, as it has in one or two remarkable instances, their tendency to adopt a lengthy rather than a rapid process of thought. Each idea follows its predecessor slowly, and they reach a conclusion long after other less gifted men have passed far beyond it. Such men delight us by the beauties of their written works, but astonish us often by the fatuity of their conversation.

Goldsmith was not the only imaginative writer of whom it might have been truly said :

> 'Here lies Nolly Goldsmith, for shortness called Noll,
> Who wrote like an angel, and talked like poor Poll.'

The substitution of words for images, as the matter of thought gives also a further explanation of the fact of which we have already given a partial account in talking of Causation (p. 161), that poetry which abounds in natural images belongs rather to a comparatively early than to an advanced stage of civilization. Poetry we have still in abundance, but by far the greater part of it is philosophic (save the mark!), analytic, lyric, or dramatic; it breaks up emotions into their elements with Browning, paints their surface with Swinburne, or describes circumstance and character with Tennyson, in his English pastorals—to my mind by far the most successful of his many-sided poetical experiments. But all truly imaginative poetry, that which paints Nature merely for the sake of painting her, and with no *arrière pensée*, is with us always more or less of an exotic, which we may admire for its artistic perfection, but with which we can hardly sympathise. The habit of thinking along a succession of images has through long disuse become difficult.

I know that I am here using the word imaginative in a sense slightly different from that usually sanctioned by the critics of poetry; they generally intend to express

by this term the allegorical or animistic substitution of one image for another, the faculty which made Coleridge hear the voice of a stray child in the plaining wind. This faculty is more directly sapped by the gradual destruction of animistic conceptions, than by the substitution of symbols for images; though for its exercise also we need to linger over the separate images suggested by the words, and to allow these images to arouse others by a process of association, which runs upon lines widely different from those which govern the connection of the verbal symbols. The faculty of which I first spoke has, however, full as much right as this latter one to the name Imaginative. It is the power of reproducing in words images which have been vividly implanted on the mind by the outward sense, and implies a long and loving lingering over those images, without any attempt to get beyond or behind them. It is this which Homer possessed above all poets, and which made him delight to describe the common operations of every-day life. It is the exact antithesis of that spirit which induces Wordsworth to blame his Peter Bell, because—

> 'A primrose by the river's brim
> A yellow primrose was to him;
> 'Twas that and nothing more.'

It would have been precisely 'that and nothing more' to Homer, and he would have revelled in the descrip-

tion of every detail. It is this truly imaginative faculty, which civilized life, with its disregard of sensible images, and its hurried rush from symbol to symbol, is fast and irretrievably destroying;

'Our every gain is purchased by a loss.'

It remains for me to accomplish the most venturesome part of the work which I sketched out for myself at the beginning of the chapter, and to lead on for a moment into a Utopia which, like all other Utopias, seems to its originator neither difficult of accomplishment, nor unlikely to issue from the womb of Time. The pathway into my fabulous region may be made to start from a fact, which we signalized when we were discussing the question, how far the reading to oneself written or printed language could be said to enlarge the whole amount of a man's experience of audible words. We there said that although all learners, and probably the majority of readers throughout their lives, translated all or some of the written words before them into ideas of audible sounds as they went along, that certain accomplished and quick readers performed this operation of translation rarely if at all, and seemed to get the sense of the passage by passing the eye rapidly along from written sign to written sign, without ever for a moment thinking of the sounds for which those written signs stood.

Do these readers, then, translate each sign at once

into an idea or image of that whereof it is the name without the intervention of the idea of the spoken name? I answer that for the most part they do not translate them at all. The practised mind and eye passes along those signs, which it is accustomed to see combined, in exactly the same way as it passes along the sounds, or ideas of sounds, which it has frequently before met with in the same combinations. The combinations of the written signs, as of the audible, must, of course, alternately rely for their validity on the combinations of the things for which they are signs; but the mind, for the most part, is content with remembering the fact of past combination, assuming that that combination is justified by experience, and glides easily along accustomed strings of written words, only pausing to translate into terms of representative thought the conclusion of an argument, or perhaps the outward fact conveyed by a sentence.

It is to be noticed, that the mind and eye can pass over a number of written words much faster than the mind and ear could follow the same words, if it were possible to articulate them clearly in the same time. The most rapid speaker does not utter a sentence nearly so fast as we could read it; but even the clearest speaker severely strains our attention if his utterance be rapid. Now, as is the direct experience, so in every character is the representation of that experience. If

we can follow along a sentence of written words more quickly than we could along the same sentence of spoken words, so too, if other things were equal, we could follow along a number of mental representations of written words more quickly than along the same number of ideas of audible sounds.

At present, doubtless, it is much easier to reproduce in minds the audible sounds than the written words, simply because we and our immediate forefathers have had much wider experience of the former than the latter; but every year gives a greater proportion of the attention of mankind at large to written speech, and it is conceivable that the time may come when ideas of written words shall be substituted for those of audible sounds as the symbolic matter of thought. The change would give an increased force of thought with little or no corresponding disadvantage. There would be no greater danger of error with the one set of symbols than with the other, and the only drawback would be, that we should probably stop less often even than we now do, to ask whether our formulæ were correct. How much further, and by what other substitutions the acceleration of symbolic thought may be carried out, who shall guess?

CHAPTER VIII.

ON NECESSARY TRUTHS.

IT will be scarcely necessary to say, after the foundation which I laid down in the first chapter and elsewhere, that I hold that the conception of Necessary Truth is absolutely self-contradictory. A Necessary Truth is ordinarily defined as one of which we are immediately certain as soon as the terms are presented to us, or as soon as we conceive together the ideas which the proposition connects. Now if the connection between the two ideas be independent of any direct consciousness, the proposition conceived as a simple mental conjunction of ideas will be neither true nor false; it will represent nothing. Such a mental proposition, could it exist, would be perhaps a necessary thought, but in no sense a Necessary Truth. The verbal proposition stating the conjunction of ideas in the mind would be a truth, but by no means a necessary one; for whether or no it be possible to think the reverse of such a supposed proposition, it would obviously be possible to state this reverse in words. We should only have to insert or

omit a *not.* Though perhaps such an unthinkable conjunction of terms ought not strictly to be called a Proposition.

It is true, that if we discovered in our minds two ideas so closely connected that we could not separate them in thought, we should immediately conclude that the mental proposition or conjunction of these two ideas was true—that it did represent direct consciousness which we or others had had at some past time, although perhaps we could not at the moment remember the circumstances of such consciousness. But this conclusion of ours would be a mere deduction from the fact which we had observed in all other cases, that every strong conjunction of ideas common to a number of sane men, represented a strong and frequently repeated conjunction of facts of direct consciousness of one of the three kinds which we have so often mentioned (Sensation, Emotion, Activity), and this defence of the truth of the proposition would rob it exactly of that quality for which its propounders contend—to wit, its necessity and immediate evidence; our belief in it would be a consequence of unbroken experience, and without that experience the belief could not exist.

But in order to make assurance doubly sure on this point, it will perhaps be well to consider separately the most important of these supposed Necessary Truths, to the end that we may see whereon their superior cer-

tainty is supposed to rest, and what right they have to arrogate to themselves this exalted position. The ground has been frequently traversed by philosophers; but since I am not quite satisfied in all cases with the arguments of the Sensational Philosophers, however much I may agree with their results; and since, moreover, I have determined throughout not to pre-suppose in my readers any wide acquaintance with the writings of the philosophers, I feel that it behoves me to discuss some of the more important portions of the subject on independent grounds.

Dr. Mansel,* the ablest modern exponent of the school which clings to Necessary Truth, informs us that Necessity is of three kinds, Logical, Metaphysical, and Mathematical. Under the head of Logical Necessity we get the three great Logical Laws of Identity, Contradiction, and the Excluded Middle (all A is A. No A is not A. Everything is either A or not A). Under Metaphysical Necessity we get as a chief law the Principle of Universal Causation. (The second law which he cites under this latter head has been so frequently disputed, that it required great boldness to adduce it as an instance of Necessary Thought). Under Mathematical Necessity we get, of course, all the mathematical axioms. He mentions a fourth class of necessary laws, to which he attributes what he calls Physical

* 'Prolegomena Logica,' chapter iii.

Necessity; but as this necessity is placed in a much lower rank than that of the other three, and in a subsequent portion of the book is almost discarded, we may safely neglect it.

Of the three remaining classes we may notice that we have already dealt with the law which is taken as the example of Metaphysical Necessity—that of Causation, and have proved at some length that it is either meaningless or false. There are left to us to consider the three Logical Laws and the fundamental axioms of Mathematics. Of these in their order.

We begin with the Logical Laws; these are said by their supporters to be not mere truths, arrived at by thought and experience, but the ultimate and necessary conditions of all thought. The first of these is the Law of Identity. Every A or all A is A. Is the belief in this axiom necessary to human thought? I believe, on the contrary, that we cannot think it at all. Let us reduce it to its simplest form, and ask whether it be possible that we can think that A is A. Let us examine the question from first principles. All psychologists are agreed that thought begins with the perception of difference, that if we lived in a perfectly uniform medium, as, for instance, in perfectly pure water, we could have no thought at all. 'Idem semper sentire et non sentire ad unum coincidunt.' Uniformity of consciousness and thought is exactly equivalent to absence of

both consciousness and thought. But it may be said that we think of and perceive identities as well as differences; thus, for instance, when I say, 'This is the same dog which I saw yesterday,' my proposition does obviously represent a thought, and the subject of my thought is an identity. But is it a pure identity? Not exactly. The dog is the same, but the time when I see it is different, and it is precisely this difference which gives a meaning to my thought.

No one in the world would say or think, 'The dog is the same as I see now,' or, the dog which I see now is the dog which I see now.' It seems, then, that all thought is either of pure difference or of identity with difference, and every proposition which has any meaning whatsoever, that is, which is the representative of any real thought, must assert, or at least imply, some kind of difference. There is an apparent exception to this rule, in what are called analytic propositions, that is, those whose predicate is a statement of the whole or a portion of the meaning of the subject; but the exception is only apparent. If the predicate be a compound one, consisting of a number of terms which make up between them the whole of the meaning of the subject, and thus form together the definition of that subject, the proposition is the symbol of the passage of the mind from one complex whole idea to the simpler elements of which it is composed taken separately. But these

simpler ideas when so separated are no more the same as they were when conjoined in the complex idea, than oxygen and hydrogen are the same in water as they are when examined separately. If by electricity we analyse water into its elements, we have two new things totally distinct from the old one whence they came. If we separate a complex idea into its simpler elements, we perform a piece of mental chemistry of an exactly analogous character. If, however, the predicate be a single word, and the proposition be one referring an Individual, or Subclass to a Natural Kind, it is the symbol of the passage of the mind from the idea of the Kind clothed round with the individual variations to that of the simple Kind-idea denuded of all such clothing. In all these cases we have difference as well as identity, and no intelligible proposition can be framed which does not express or imply some difference between the subject and the predicate.

What I have said here is, in fact, merely another form of the definition of thought which I have assumed throughout. Thought, I assert, is the passage of the mind from one idea to another. Even when I think for some time of the same person, I think of his different qualities in succession, or of the different times when I have met him.* Now the proposition A is A asserts, if

* I cannot refrain from quoting in this place the delightfully vigorous condemnation of the law of Identity by Hegel:—"The Law of Identity is virtually

it be a proposition at all, that the mind passes from the subject to the predicate, from A to A. The mind can, in truth, pass from the thought of A, considered under one set of circumstances, to the thought of A under another set of circumstances; but here the circumstances are supposed to be exactly the same, or the mind is supposed to move from one point to the same point—a sufficiently difficult operation. In fact the law of Identity, so far from being the universal formula for all thought, is exactly the formula for the negation of thought. We can only think that A is A by supposing two A's on different portions of an imaginary bit of paper and then asserting that they are the same, *i. e.* exactly resemble each other. That A is A, when the two A's are not really two but one, we cannot and never attempt to think.

Mr. Mill, at the very end of the Second Book of his Logic, gives a somewhat perfunctory examination of the two remaining logical laws. With regard to the Law of Contradiction, he seems to me first to state the true explanation and then, without any sufficient reason, to

self-contradictory, for a proposition always presumes a distinction between subject and predicate, while the present one does not fulfil what its form requires. It is asserted that the maxim of Identity, though it cannot be proved, regulates the consciousness of everyone, and that experience shows that it is accepted as soon as its terms are apprehended by consciousness. To this pretended experience of the School may be opposed the universal experience that no mind thinks or forms conceptions, or speaks in accordance with this law.'—Hegel's Logic, translated by Wallace.

discard it. He says (Book II. chap. vii. paragraph 4), 'As I have hitherto said nothing of the two axioms in question (those of Contradiction and the Excluded Middle), it is not unseasonable to consider them here. The former asserts that an affirmative proposition and the corresponding negative cannot both be true [No A is not-A], which has generally been held to be intuitively evident. Sir William Hamilton and the Germans consider it to be a statement in words of a form or law of our thinking faculty. Other philosophers not less deserving of consideration, deem it to be an identical proposition; an assertion involved in the meaning of terms; a mode of defining Negation, and the word Not.'

'I am able to go one step with these last. An affirmative assertion and its negative are not two independent assertions connected with each other only as mutually incompatible. That if the negative be true the affirmative must be false really is a mere identical proposition; for the Negative proposition asserts nothing but the falsity of the affirmative, and has no other sense or meaning whatever. The Principium Contradictionis should, therefore, put off the ambitious phraseology which gives it the air of a fundamental antithesis pervading nature, and should be enunciated in the simpler form that the same proposition cannot at the same time be false and true. But I can go no further with the

Nominalists; for I cannot look upon this last as a merely verbal proposition. I consider it to be like other axioms, one of our first and most familiar generalizations from experience. The original foundation of it I take to be that Belief and Disbelief are two different mental states excluding one another. This we know by the simplest observation of our own minds. And if we carry our observation outwards, we also find that light and darkness, sound and silence, equality and inequality, preceding and following, succession and simultaneousness, any positive phænomenon whatever and its negative, are distinct phænomena pointedly contrasted, and the one always absent where the other is present. I consider the maxim in question to be a generalization from all these facts.'

Surely a more astonishing paragraph than the foregoing was never penned by a clear and consistent thinker. Let us take two of the sentences and compare them; first we have; 'The former [Law of Contradiction] asserts that an affirmative proposition and the corresponding negative cannot both be true.' Then, a little below, 'That if the negative be true the affirmative must be false really is a mere identical proposition,' *i. e.* a mere case of the law of identity and as valueless as it, except for the purpose of definition.

In this latter sentence let us substitute for 'false' its exact equivalent, 'not-true.' The statement then be-

comes, 'That if the negative proposition be true, the affirmative must be not-true, is a mere identical proposition,' or putting it into another form, 'that an affirmative proposition, and its corresponding negative, cannot both be true, is a mere identical proposition.' But this very proposition is, according to Mr. Mill's first statement, the proper form (or at least a proper form) of the Law of Contradiction. The conclusion necessarily follows that the Law of Contradiction is a mere identical proposition, and we are rejoiced to think that our labours are so soon terminated, and that we may put the Law of Contradiction aside on the shelf with its brother and prototype The Law of Identity.

Suddenly Mr. Mill tells us he can go no further with us, which, as he apparently has gone the whole distance required, is not at all disturbing; but he thereupon astonishes us by informing us that this Law of Contradiction which we had just confidently thrown aside as valueless, is really one of our earliest generalizations from experience. He says that this Law rests upon the foundation of the actual observation of the fact that Belief and Disbelief are two different and mutually exclusive mental states. Now if Mr. Mill means by disbelief merely all that is not belief, belief and disbelief are mutually exclusive in exactly the same sense as A and not-A are. If I call one state of thought A, I shall call all thought not

comprehended in that state not-A, until I choose to break it up further and give different names to its parts; that No A is not-A, or that belief is not non-belief, asserts merely that if I have drawn a line round certain mental tracts, calling all inside A and all outside not-A, I have excluded all that I have excluded.

But I think Mr. Mill means more than this; belief and disbelief are not quite the same thing as belief and non-belief. Certainly most of his instances are not mere negatives, but rather privatives; they assert the absence of an expected or imagined quality, or suggest if they do not actually imply the extreme opposite of some quality. Yet do these no more exclude their opposites than any other unlike states. That light is not darkness is exactly as much and no more a case of the Law of Contradiction than that light is not mud, if mud be one of the things excluded, that is, not included in the notion of light. All mental states, as long as they occupy consciousness, exclude all others, both those which are and those which are not directly opposed to them.

Mr. Mill's new Law of Contradiction would really be very nearly identical with that formulated by Mansel, 'A thing cannot be conceived as having contradictory attributes. Contradictory attributes are merely those which imply the not-being of a given attribute, so that the law will become in simple form, No thing can have

at the same time one attribute, and another attribute which implies that that attribute is not present; which we may reduce to this, 'A thing cannot at the same time have a given attribute present and absent.' But this statement, though not identical with the Law of Contradiction, is really merely a case of it. The attribute is present to consciousness if it be inside the circle on which I have at the moment centred my thought, all outside being blank darkness. Now the attribute is conceived as one thing indivisible in thought, if therefore I say an attribute which I have put inside the lighted circle is not outside it, I merely illustrate that Law which Mr. Mill asserts to be a mere identity or definition of negation that, to wit, that no proposition can be at once false and true, since outside is precisely equal to not inside, it being impossible to conceive an attribute as occupying space, and thus lying partly inside and partly outside of the lighted circle.

The Principle of Contradiction does indeed require experience for its establishment, but the amount of that necessary experience is not large. I require just two differing ideas in order that I may conceive the notion of difference between one idea and another. When the notion of difference is once found, the Principle may be formulated. I notice that A is different from other things, and therefore can centre my attention upon it so as to exclude all other things.

The Principle of the Excluded Middle, Everything is either A or not A, may be reduced to a case of the Principle of Identity even more simply than can the Principle of Contradiction. If I have drawn a line round one portion of consciousness or knowledge, and called it A, and called every-thing outside that line not-A, then Everything-less-A and A together make up Everything. Not-A is purely indefinite—it is simply Everything except A: I put back to this the A which I have taken away from it and Everything remains. The statement merely comes to this: A and everything I know except A make up the whole of my consciousness. This whole of consciousness is the whole of consciousness—A is A. Neither do we get any further by taking the form of the Principle which Mr. Mill prefers. A proposition must be either false or true, that is either true or not-true. This, like his second form of the Law of Contradiction, is not a new form of the Principle, but merely a special case of it. Restricting my field of observation to propositions I find that some of them are marked with certain characteristics in virtue of which I call them true, all other propositions indifferently I call not-true. I assert then, in accordance with the Principle of Identity, that a whole made up of a class of propositions, and all other propositions except that class make up the whole of propositions. That all propositions must be either true or not-true propositions, or that every proposition must be either false or true.

Mr. Mill, who apparently attaches as little value as I do to the Law of the Excluded Middle, brings against it an objection which I do not think will hold. He considers it not only valueless, but also to a great extent untrue. He says, 'I cannot help thinking this principle a surprising specimen of a so-called necessity of Thought, since it is not even true, unless with a large qualification. A proposition must be either true or false, provided that the predicate be one which can in any intelligible sense be attributed to the subject; (and as this is always assumed to be the case in treatises on logic, the axiom is always laid down there as of absolute truth.) "Abdecadabra is a second intention," is neither true nor false. Between the true and the false there is a third possibility, the Unmeaning.'

Against this reasoning a supporter of the Principle might naturally object that, since words are signs of thoughts, and propositions are signs of the connections or disjunctions of thoughts, a so-called meaningless proposition, not being the symbol of any such connection or disjunction, is not in fact a proposition at all. Moreover he might urge that even taking Mr. Mill's example as a legitimate one he fails to make out his case. If a certain number of things are called 'Second Intentions,' then all other things will be called not-second-intentions according to the principle which we have laid down above. Then of the two contradictory proposi-

tions—Abdecadabra is a second intention,—Abdecadabra is not a second intention,—the former will be false and the latter true. Holding as we do that the Principle of the Extended Middle is a mere case of the Principle of Identity, we must needs hold that it is universally true and for the same reason that it is invariably valueless.

But the most severe portion of our task is not yet accomplished. There remain to us for discussion the mathematical axioms. It is sufficiently obvious that these are neither untrue nor unmeaning. It is clear then that we cannot dispose of them in the same summary fashion, as that with which we have treated the other so-called Necessary Truths. We must attempt to go to the very root of the matter, and this we can only do by examining the real nature of the object-matter to which these laws apply. I shall confine myself in this place to examining the nature of the object-matter of one of them—Arithmetic. This object-matter is obviously Number, and I shall discuss that only, and abstain from entering into a further discussion of the object-matter of Geometry for several reasons.

In the first place arithmetical conceptions seem to be necessary for the due understanding of even the first principles of Geometry. *Two* straight lines cannot enclose a space. A triangle is a plane figure enclosed by *three* straight lines. Now the converse is not true, there are no geometrical ideas involved in Simple Arithmetic, whatever

there may be in the higher algebra. It would be quite possible to be a proficient in arithmetic without knowing a word of geometry, or having conceived a single notion of the relations of things in space, but without numerical notions geometry would be impossible. It is true that when the simple numerical notions were once formed and applied to the measurement of space, the science of Geometry, by reason of its more concrete nature, and the possibility of aiding the mind by the use of diagrams, became easier than its sister Arithmetic and therefore was the earlier carried to something like perfection, but this makes nothing against our statement.

In the second place the reduction of the geometrical axioms to generalizations from experience seems to me to have been much more satisfactorily made out than that of the arithmetical laws. That two straight lines cannot enclose a space is a fact which if not exactly proved to us by our daily experience (since we never see exactly straight lines) is at least suggested by such a number of extremely similar experiences, that whether or no we should believe the statement as soon as we heard it, we may be sure that, if we disbelieved it at first, experience would soon assure us of its truth. Since then it is a canon of philosophy not to assume more laws than are absolutely needed to explain our facts, and since the belief in the geometrical axioms may be explained in the same way as all those other beliefs which are confessedly

derived from experience, it would be unphilosophical to explain this belief, by the assumption of any such new fashion of gaining it as the immediate intuition of the necessary conjunction of two ideas the moment they are presented to consciousness.

Now is the same method possible with regard to numbers? Mr. Mill says that it is. That I learn that two and one is three by comparing two apples and one apple separately with the same apples placed together. Other philosophers, arguing on the same grounds, have asserted of the arithmetical axioms what Mr. Mill attempts to prove of the geometrical, to wit, that they are never exactly true. Even as the statement that two straight lines cannot enclose a space depends upon the implied assumption that it is possible to get in experience two exactly straight lines, an assumption which is never precisely verified; so the assertion that one and two is equal to three, if considered as a statement about any given things, assumes that each of the three units is precisely equal. Now as no two things in nature are precisely equal, the assertion, it is argued, is only roughly and not precisely correct.

The argument would be irrefragable if number really belonged to things in the same sense as colour or shape does. But it seems to me more than doubtful whether this is the case. In the first place every quality of a thing remains the same unless some change has

taken place in the thing itself; a triangle remains a triangle, and a dirty plate a dirty plate, unless I cut off a corner of the one or wash the other. Now if I have a quantity of oranges on the table before me and subsequently place another by the side of them not touching any one of them, it is clear that no change has taken place in any of the oranges, yet is their number altered. Number then can be changed by an alteration which does not in any way directly affect any of the things previously numbered. Moreover, the fact that we count as freely and habitually things of entirely dif ferent sizes as those which are nearly uniform, and assert that two toy terriers and a St. Bernard make three dogs, as readily as that two damsons and a third make three damsons, seems to point to the conclusion that numerical equality is not and is not imagined to be the same thing as quantitative or geometrical equality.

Now the whole argument I have quoted above, and at least the illustration of Mill,* require the assumptions that these two equalities are really one and the same, and that number is a quality of things. Since then the proofs of the Sensationalist writers of the experiential derivation of numerical axioms seem either to be based on doubtful assumptions, or at least to lack clearness and cogency, we must begin the investigation of them

* Cf. Mill, 'Logic,' Book II. chap. vi. sec. 2.

afresh with such light as we may be able to borrow from other sources.

The most philosophical treatment of the question of the true nature of Number occurs in a treatise, the whole of the phraseology, and the greater part of the doctrines of which are diametrically opposed to the positions which I have taken up in this book, 'Mansel's Prolegomena Logica.'* Since, however, his results, which I believe do not in fact greatly differ from my own, are expressed in language which implies, what I believe to be entirely erroneous theories of the nature of thought, I must attempt a solution which, in form at least, will differ from his. We may start, however, from the same point, and begin by admitting that our first notion of number is got from succession of sensations, or, more strictly, from succession of markedly distinct sensations; number is, in fact, distinction, and the first number is not 1 but 2, as the ancients well knew, though our philosophers and mathematicians often ignore this all-important fact.

But although the first notion of number and the first number itself was got by noticing a distinction between two successive sensations, I do not think that either the higher numbers or any of the axioms of arithmetic could be derived from this source alone. Successive sensation could only give us numerical

* Mansel, 'Prolegomena Logica,' chap. iv. pp. 114–125.

statements in this simple form: Sensation A and the next sensation, B, are distinct, or two; so also are sensation B and sensation C. As long as the sensations are truly successive, I can only compare A and B, and B and C. I can never discover any relation connecting A, B, and C, since A has by hypothesis vanished before C has appeared in consciousness.

We have so far, then, got but little way towards our goal; we have found Number, but only one number, and no laws as to the combination of numbers. How, then, do we take the next step? I think in this way. We have one organ of sense, the eye, which takes in, in what seems at least to be a single complex sensation, a whole varied plane of colours, on each part of which, distinguished by some difference, we may, if we choose, concentrate our attention.

I look at the flag of Italy; I seem to see at one glance a varied mass of colour; but I may, if I choose, look first at the red, and observe its difference from the white, in virtue of which I say the colours are two, and repeat the same process when I rest my eye on the spot where the green joins the white. Now, during the whole time of this operation, the whole flag has been present to me, though my attention has been occupied by its successive parts. At the end I view the whole flag again, and find that the whole visual space occupied by the complex image of the flag

is the same as that occupied by the successive colours which, with their differences, I have examined. I have got before me a complex sensation which, as I have discovered, represents a repeated potential distinction between its parts whensoever I choose to cast my eye down it from top to bottom. This coloured space with a *repeated* potential distinction I require a new name for; I call it therefore 'three colours.' In the same way, if I found three possible distinctions in passing from top to bottom of the visual plane, I should say there were four colours.

It is then the simultaneous combination in one complex sensation of a number of elements which may themselves, by reason of their marked differences, be distinguished from each other and from successive sensations, that gives us all notions of the higher numbers.

The same experience acquaints us with the arithmetical laws. If I take a variously coloured plane and notice a marked dividing line of colour running down the middle of it, I shall in accordance with the method which we have described, say that so far it consists of two parts, that is, that there is a sufficiently marked distinction between the two halves of it for me to concentrate my attention alternately on one and on the other, and to discover a difference in passing from one to the other. If, further, in

directing my attention to each one of these two parts separately, I discover that each is capable in the same way of yielding successive and distinct sensations, I shall say that each of these halves itself consists of two parts. Now if I recombine the picture, and run my eye rapidly down it from top to bottom, noticing as I go the distinctions I have made, and counting them by means of the conceptions of number which I have already got, I shall find that there are three divisions or four things; and I shall, by comparing this with my former process, be able to say that to divide a thing into two parts, and to divide each of these two parts into two, is the same in result as at once to divide the thing into four parts. It is from succession combined with simultaneity that I get all my notions of arithmetic.*

It may be argued that we might as well derive our notions of number from successive sensations combined with the memory of past sensations. I willingly admit that had we no other means of getting the higher notions of number we might derive them from this source, though how far without the aid of the eye we

* Since writing this I have noticed that the same doctrine is propounded by Mr. Green in his Introduction to 'Hume's Treatise on Human Nature,' sec. 257, etc., but the proof of it is not given, as indeed it was not there required. Mr. Mill's argument about two and three pebbles, although it seems at first sight to resemble ours, is in reality diametrically opposite to it. He assumes that a change in number involves a change in things, I, that it involves merely an act of mind.

should be able to get the notions of the combinations of the numbers and the laws of arithmetic I think it would be hard to determine. But in the first place it would be hard to discover any suggestion in mere memory of sensation which should impel us to enumerate these memories, while the fact of the several visual divisions being at the same time presented in a complex whole suggests to us immediately to give to that whole a name which shall mark the fact that it contains within it these divisions; in other words, to call it a number. In the next place, wherever a belief or notion may be derived indifferently from direct consciousness and from mere representative or ideal consciousness, that is, from imagination or memory, it is always preferable to decide that it is due to the direct consciousness; since, other things being equal, consciousness and its connections are much more vivid than the ideal consciousness and its connections, and therefore the former are much more likely to produce a notion or belief than the latter.

But it may be objected that after all we have brought back number and its laws to experience, since it is merely an experience of the different colours in the plane of sight presented to us which induces us to divide that plane. After all our long circumbendibus, we seem merely to have arrived at the simple statement that Number is derived from counting colours in a picture or single presentation of sight. If this were in

truth our result we should certainly have proved ourselves the most inept of reasoners, since in order to count you must first have the notion of all numbers. But if the notion of number is in any way derived from mere observation of that which is presented to us by external vision, all that the sensationalist philosophers desire to prove will be established. Number will be shown to be necessarily a quality of things, and however great be the difficulties of this view we shall have to accept it, and to swallow the difficulties as best we can.

The question, then, is, Is the number which I discover in the diversely coloured plane which is at every moment presented to my view, or do I bring it from my mind and add it to that view? I answer unhesitatingly that the latter solution is the true one. In the special instance we took, that of the flag of Italy, the number of colours seemed to be, as it really was, in the thing; but the explanation of this fact is merely that in order to study this flag, I had already arbitrarily cut it off from all other things which really would be presented along with it at any given moment of sight. If, however, I placed my eyes so near to it that it really covered the whole range of sight, I should then most certainly not have three distinctions, but an innumerable quantity according as the light struck one portion more than another, and a thousand other such causes.

It is true that the lines between the main colours would be the most marked distinctions, and I should probably still say that there were three colours, and three only; but this would only mean that there being a countless multitude of potential states to be got out of the single complex picture before me, I chose to concentrate my attention on only three of those successively; to mark definitely in my mind two passages of distinction in descending from red to green through white. I might have made a much larger number of divisions, or I might have attended only to the stronger of the two contrasts. The number of colours which appear to me in one presentation of sight at any moment correspond precisely to the number of distinctions which I have chosen to draw, and might have been either more or fewer at my will.

Let any one ask himself how many things there are on the table. He will get on very well with the more obviously distinct things—the books and the inkstand, but when he goes a little further, and asks whether he ought to count the wafers in their box or the spots on the table-cloth, he is in difficulties. The fact is, any answer to such a question would be equally true, from one up to ten million, though all answers would not be equally in accordance with common parlance, since it is obvious that all men would make a

book a distinct division or unit in the number, and would not make a crumb or a grain of dust one. But within these extreme limits there would be a number of possible answers, any one of which would accord sufficiently well with common parlance.

Is number, then, entirely arbitrary? Not at all. We always have reasons for drawing or omitting to draw a dividing line, though the reasons are not the same in all cases. In the first place, if any portion of complex visual presentation has frequently been seen by us in other combinations, our attention is naturally attracted to it, and we divide it off from the other parts of the picture and *make* it *one* thing. Still more is this the case if we know that it can at any moment be removed from the picture, all the other things remaining the same. We generally draw lines round or constitute units all moveable things, though even this rule is not without exceptions where the moveable things are small and form portions of one apparently uniform whole. Amongst the elements of a picture we should count as one the sand and not each grain thereof, or even a handful of corn rather than the single grain, although these might be so few that there would be no difficulty in counting them.

It is the truth that men begin by considering as units only those parts of the picture that they know are moveable, which furnishes an explanation of the fact that in

many languages numbers do not exist independently, but only as a species of adjuncts of the names of objects which very early experience has shown to be moveable, generally those which are themselves capable of motion; thus, with certain tribes in the Malay Peninsula, in order to express two books or three hats, you have to say two-man books or three-man hats. The observation that many races independently got their notions of number from their fingers and toes is another illustration of our argument. With the savage (though perhaps not with us) both fingers and toes are freely moveable, and they were to him an instance of moveable things which he carried ever about with him. The other qualities, according to which man made division of the whole picture before him, came later, and are even to this day more variable. Vivid distinctions of colour are perhaps the most important, but it seems always difficult to conceive as two, things which we have never seen separated. We can count the branches of the tree and conceive them distinctly as a number, for we have seen them lopped off, but the ordinary man is apt to consider the flower as one whole and would not break it up into parts in thought, whereas the botanist undoubtedly would.

But however suggested, by peculiarities of our pursuits or past experience, the breaking up of the complex whole of sensation into its parts so as to constitute it a

number is always a definite determination or activity of the mind itself. The idea of any number is the conception of a whole combined with the consciousness that the mind has broken up that whole into parts, and fixed its attention on each of the parts separately. The consciousness of the different lines of division thus drawn survives when the picture is again viewed as a whole; now no longer an indeterminate whole, but one made up of distinct parts. The conceptions of Number and the Laws of number are indeed drawn from experience, but it is merely the experience of certain activities of the mind, of its capacity of combining the results of repeated activities, and of the observed laws of these combinations. Number is the result of human thought and no quality of external things. Mansel, and his master Kant, who call succession a form of thought and derive number from it, are at all events nearer the mark than those who seek for it an origin in sensational experience.

The fact that the conception of a number involves a whole present to consciousness, of which each of the parts and the dividing lines between them remain distinct in that consciousness, fixes a very narrow limit to the numbers of which we have any real notion. I can form a perfectly clear mental picture of my five fingers, and in this picture can perceive at the same moment, or at least what seems to be the same moment, all the

lines of demarcation; but I find it much harder to conceive distinctly as one picture ten objects of any kind, with all their dividing lines. I am not quite certain that I have really a distinct mental picture of a whole broken up into ten parts, so that I could instantaneously recognize the difference between it and a whole divided into eleven such parts. I am quite certain that of the higher numbers I have no ideas whatsoever. I can talk of them, since I have their names, or I can reason about them, by extending to them laws which I have found true of smaller numbers, but the very method by which I carry out this extension proves to me that I have no real notions of these higher symbols as numbers in the proper sense, that is, as wholes broken up into parts, and with each of the parts distinct in the mental pictures of these wholes.

If I wish to add 23 to 35, I first add three, of which I have a definite conception, to five, of which also I have a clear notion, and arrive at 8, which too I can picture to myself. But in order to add the twenty to the thirty, what do I do? I conceive each ten as a whole undivided mass, and do not attempt to think of its parts, but merely of the fact that twenty is the name for two such masses, and thirty for three; now I can add these two complex wholes, one consisting of two parts and the other of three, in exactly the same way as before, and conceive the result, five, which I put down. My answer

then truly is, 'two masses which are not broken up, and three masses which are not broken up, are equal to five unbroken masses. Each of these masses may be broken up into ten equal parts, of which each part is conceived as equal to each of the parts of the complex whole eight which I got at by the addition of the unit column.'

It may be asked, Does the statement that an army consists of 50,000 men convey to us no idea? I answer, None whatever by itself, except of a huge mass. If, however, we are told that one army consisted of 50,000 and the opposing one of 100,000 men, the two statements together do convey a definite idea. We imagine two huge masses, whereof the one covered twice as much ground, or was twice as powerful as the other. It is only when we can get a relation between two or more of these large symbolic numbers, which relation we can express in terms of thinkable numbers, that their names suggest to us any ideas except those of indeterminate multitude.

So far I believe that my treatment of the subject does not differ greatly in essentials from that of Dr. Mansel. We have now to ask in what sense these laws of numbers or of certain mental activities and their results can be called necessary laws. Dr. Mansel says that they are so because they condition all human thought; three and four must be seven to all men. The fact is

that the statement is not even true; to a good many savages and men of low civilization three and four are not seven but an indefinitely large number; their powers of keeping in their imaginations several divisions of the whole picture before them do not rise to this point.

That to every human being, who can form the idea of seven, three and four or two and five indifferently constitute that number is probably true; but this seems to me only to point to the fact, which one might naturally have expected before it was observed, that the activities of different individuals of the same species greatly resemble one another, and that the more important of them seem identical in all members of the species. All men digest their food in the same fashion, and move their lungs according to the same general laws; they may have a better or worse digestion and so they may be better or worse arithmeticians; but no one considers the laws which govern the action of the lungs or digestion to be in any sense necessary or that we derive our knowledge of them from anything except experience. The laws of number will doubtless remain the same as long as man remains what he is, but so also will the laws of digestion.

It is true that I can without difficulty fancy the laws of digestion altered, and that it is extremely difficult, if not absolutely impossible, to conceive any change

in the laws of number; but this difficulty arises simply from the fact that in the latter case thought has to judge of one of its own activities, and in the former of that of an entirely different organ.

If Dr. Mansel merely meant by the word Necessary that in which a change was inconceivable to thought, we should not be inclined to quarrel with him, though we should prefer to say, 'extremely difficult to conceive.' But this inconceivability, since it merely arises from the close connection between the judge and the thing judged, does not in any way involve any greater stability of the law than of any other observed fact whatsoever. We might lose to-morrow our power of forming a conception of a whole distinct into parts, and then number and its laws would be absolutely nonexistent. We should then be different from our present selves, and we cannot conceive ourselves as aught else—yet we change daily. Neither has this inconceivability of the negative of these laws any bearing on the question of their derivation or evidence. They, like all other laws, arise from the experience of consciousness, and depend for their force on the frequency and strength of that experience. It is not indeed experience of sensation, but of activity that I get. It is experience none the less.

CHAPTER IX.

EPILOGUE.

BEFORE summing up the results of our task it may be well to say a few words as to an objection which with some show of reason might be urged against our method. A critic might remark that even in our attempt to reduce Causation to a merely subjective existence—to show that it was a mere fashion in which we looked at phænomena, we have really assumed its objective or external nature. We have continually spoken of the action of experience in establishing internal connections of ideas, and of the law of the continued adjustment of the race to its circumstances. Now both these expressions involve the notion of that very external nature of cause which we have taken upon ourselves to disprove, so that our conclusion is in fact contradicted by our premises.

It might be a sufficient answer to this objection to observe that in a work avowedly sceptical it is the negative and not the positive portion of the argument which is intended to be of weight. If from premises

which assume the objective or external nature of cause I can legitimately draw a conclusion which asserts its merely subjective or internal nature, then my premises and my conclusion balance one another. The contradiction between the two proves that there is something self-contradictory in the premises, though it does not give me reason for affirming that the conclusion is to be preferred before them. The mind is reduced to a state of balance or doubt between two inconsistent opinions which both apparently rest on the same evidence—in other words, to a state of pure scepticism in the proper meaning of that term. The method of Hume, and before him of the Pyrrhonists, was precisely this: to take the ordinarily accepted dogmas and to draw from them conclusions contradictory to those dogmas. I may safely assert that the ordinary external theory of causation is as commonly assumed by Hume as by any writer who held that theory in its crudest form—and further that Hume's method entirely justified him in that assumption.

But I think that I am not forced to take up this unassailable but purely negative ground. I believe that my own theory rests merely on historical evidence of the progress of the race, and as long as it pretends to be nothing more than an historical theory, and to make no assertions as to the future, needs no assumption whatsoever as to the nature of cause. By studying history I

get constant evidence of the external circumstances of the individual and of the race changing, and of the internal ideas and beliefs changing therewith. But this historical observation, which is all I need to establish my conclusion, is susceptible of many explanations, as to all of which I may, nay must, on my own principles, observe a pure impartiality.

The facts may be accounted for either by the ordinary theory of direct action of the circumstances on the mind, or by the Liebnitzian doctrine that the soul and its external circumstances, which really are entirely independent, have been so fashioned by their Maker as to run parallel like two clocks set together at the beginning and keeping accurate time; a theory which, if carried to its logical conclusion, would destroy all causes but one—God.

It would not even be necessary for the explanation of the facts to assume that the distinction between the circumstances and the self was real; the facts as observed might equally be explained on the extreme Ideal theory of the real unity between self and circumstance; on such a theory the concurrent progresses of the external and internal would become merely two sides of the same thing, and all necessity of introducing Cause to explain their constant relation would vanish. Do I then incline to this latter theory? Most decidedly not, and simply because it is one propounded by Reason,

and (like all the rest) going beyond the evidence on which Reason depends for its conclusions—that of direct consciousness.

All that I have concerned myself directly with in this treatise is to show that the historical data on which all the theories equally are founded is, if properly treated, destructive of one of them, that, to wit, most commonly accepted, of constantly recurring objective causation. I hold, and must needs hold, that the same destructive criticism might equally well have been applied to any of the others. That I have frequently used language implying the very theory which I seek to destroy I freely admit, nor is this wonderful, when the fact which I have already pointed out is duly considered —that language was formed when an extreme and now universally rejected version of this theory was universally held. It would be equally impossible for me to find words on this subject which did not imply this original theory of causation, as it would for a divine to preach a sermon in which he should avoid all language implying the corporeal nature of the Soul. Yet is there one among them who now holds that the Soul is a body? Let him who blames me on this score listen attentively to the next sermon he hears, and let the lesson of charity it *conveys sink deep* into his *heart.*

Putting aside then this objection, let us inquire what is the net result of our analysis. It may be stated in a

very few words. The office of the Reason is instrumental and not ultimately judicial. That is the last word, as it was almost the first, of Scepticism. Reason can take the facts of experience and arrange and rearrange them as suits best the interests of the man, but she can in no way go behind them. The expectation which arises from those facts is itself in no way rational, and although the results of reason may often alter the amount of expectation or turn that expectation towards a new quarter, by insisting upon an unobserved experience or on the importance of the experience of others, the reason can give no ultimate basis to the expectation. Any hypothesis which reason throws out as an attempt to *explain* experience must for ever rest unproved and unprovable. I mean not of course such general principles as the Law of Gravity, etc., which, as I have attempted to show, are not strictly explanations of experience, but merely a succinct fashion of stating a common element in a number of experiences. Such expectation as belongs to these laws results, not from the action of reason, but from the direct connections of experience which the laws sum up.

The explanations of which I spoke above are those which do not merely connect a number of experiences, but are supposed to give a groundwork or rational foundation to experience itself. They belong equally to all Schools; they appear in Forms of Thought and

Sensation with Kant, in the Uniformity of Nature with Mill, in the Pre-established Harmony with Liebnitz. They are all very ingenious and pretty, but they all labour under one incurable defect; they are transgressions of Reason beyond her province.

There remains one question on which perhaps it is needful to enter, though any difficulty which may arrive with regard to it will depend rather upon the accidental double use of a word, than upon any more important foundation. How far does philosophical Scepticism necessitate or conduce to unbelief in matters of Religion?

The answer may be stated boldly. There is one form of Religion, and one only, which philosophical Scepticism would sweep to the winds—that which pretends to be purely rational, to found itself entirely upon Reason, and to make no demands upon that Faith which is the evidence of things not seen. The doctrines of Religion, since they are not certainly given in experience, must be either to be evolved by reason from experience, or must be given to some other faculty of mind or Soul in a fashion which transcends all experience. To the first of these two theories, Philosophic Scepticism returns an unhesitating negative, but when the second is stated she humbly bows her head, and presumes not to judge beyond her province. Against the theologico-philosophic theory which makes of God

the Great First Cause she protests loudly; against the Christian doctrine, which states that he is the intelligent framer of the Universe, she has nought to say, except that that doctrine contains difficulties which must be surmounted, not by Reason, but by Faith, an exception which surely the Divines have always been willing to allow, and may well grant to that School which denies to Reason her usurped authority of judging of the results of Faith.

Those who think that in losing the rotten prop of the rejected philosophic doctrine, Religion has received a serious damage, may do well to consider that Religion subsisted and was strong for hundreds of years in the minds of the Jew and the early Christian without such adventitious aid, and that even to this day ninety-nine out of a hundred sincere believers are unaware of the existence of this supposed bulwark of the Faith.

To take a concrete case, that of the alleged performance of a miracle. Dogmatic Philosophy would be inclined to say that a violation of the Laws of Nature was impossible. Pure Scepticism would declare that the so-called Laws of Nature were merely an historical statement of the experience of a multitude of men; that there could be no impossibility in the coming-into-being of any new experience whatsoever, although the fact that this new experience was opposed to a very common one would render it hard for

all men (including the sceptic himself) to believe in it. But this difficulty of belief will in no way affect the objective likelihood of the phænomenon, but will merely be another side of the fact that this phænomenon is uncommon, a fact which the asserters of the miracle will not be in any wise inclined to dispute, since otherwise it would not be a miracle at all. Scepticism will then leave the question to be argued out either on the narrowly rational ground of the credibility of the witnesses, or the wider religious ground of the spiritual value and moral import of the miracle itself. The sceptic himself will at least not be hindered by his philosophic position from accepting any creed which involves, as all the widely accepted creeds do, some belief in the occasional disturbance of the order of Nature by the direct interposition of a higher will. Further than this he will seek in every religion, as the distinguishing mark of its religious character, some mystery or mysteries which soar beyond the range of the Understanding and appeal directly to the Faith.

A good metaphor is worth a volume of argument. Let us say then that Scepticism is the Sheep-dog of Philosophy, and that his task is to keep the Reason within the pleasant fold of the Arts and Sciences. The Reason is an unruly and venturesome sheep, and is for ever trying to stray away into the wilderness of Metaphysics. Up starts Scepticism, barks at her, and drives

her back; but scarcely has he lain him down again, when she tries to break out afresh in some new direction. It seems however that each succeeding attempt is less venturesome and more half-hearted than its predecessor, and that the duties of the Sheep-dog require ever less activity and vigilance. It may perhaps be hoped that the time will come when Reason will graze contentedly in her pleasant pasture, and the faithful Sheep-dog Scepticism may lie down—sleep—and be forgotten.

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